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ABSTRACT

This report outlines a method of teaching eighth-grade science with an environmental perspective. Areas of study normally found in junior high science curriculum are integrated with environmental concepts. This particular approach to 8th grade science is intended to be process oriented, field oriented, problem oriented, and relevant to the local community. The class is divided into three or four heterogeneous groups simulating a community situation. Students choose from a list of environmental topics and are given a "group plan" comprised of a list of general questions unique to the subject area to guide their research. The role of the instructor is one of facilitator; students do all they can by themselves. Students are encouraged to expand their learning sources and gain actual environmental experience within the community through letters to organizations. Block scheduling is suggested. Provided are: readings, information and, community sources; group plans; and a list of environmental educational concepts. Over one half of the book consists of appendices: Student Correspondence; Student-Oriented Information for Distribution; Resource Bibliographical Information; Student Papers on Speakers, Filmstrips and Movies; and Excerpts from Group Plan Research. Related documents are: SO 002 611, SO 002 612, and SO 002 615. (Author/SJM)

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HUXLEY COLLEGE
CENTER FOR ENVIRONMENTAL EDUCATION

AN ENVIRONMENTAL APPROACH TO EIGHTH-GRADE SCIENCE

Herbert J. Sargo

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A Division of Western Washington State College
Bellingham, Washington 98225

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Herbert J. Sargo
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Sedro-Woolley Project Report #3
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TO THE TEACHER:

Presented here are ideas for multidisciplinary environmental education. The objectives of the ideas and methods suggested are clearly stated. The overall objective is to provide you, the teacher, with an aid in the development of your approach to teaching for and about the environment. These are not learning packages designed to be applied verbatim, but suggestions for ideas and methods that will enable you to develop learning packages. The contents of this report represent only the first treatment of the idea. It is published in this form in order that teachers may have an opportunity to experiment with it.

You will have to design your personal approach to environmental education. You are an environmental educator now, whether you realize it or not, because the environment is all around you and you are teaching about the environment that surrounds both you and your students. The state of the environment indicates that there is something wrong with the way in which you have learned to perceive and behave relative to the environment, and with the way you are teaching others to learn and behave in their environment today.

The ideas presented here are examples of ways in which you can incorporate environmentally beneficial learnings into your curriculum. The intent is not that you "add on" something specifically environmental to your curriculum, but that you incorporate environmental learnings into your treatments of the subject matter with which you have already been dealing. The specific manner in which you treat your responsibility to educate for environmental stewardship is up to you. It is hoped that these and many other ideas will help you in your effort to understand the meaning of "environmental education" and its implications for you as a teacher and as a human organism.

The environmental education development project of which this report is a part is an ongoing one, and it is hoped that all who attempt to use the report will participate in the project by reporting the results of their efforts to the project staff. The staff will compile the ideas and methods collected. This will enable all working on the development of environmental education to share each other's work and will promote the spirit of cooperation essential to the success of any project as broad as this one.

Please report the methods and results derived from your use of this report to:

John Miles, Director
Environmental Education Project
Huxley College of Environmental
Studies
Bellingham, Washington 98225

Thank you.

TABLE OF CONTENTS

TO THE TEACHER i

PURPOSE 1

INSTRUCTOR ORIENTATION SOURCES 1

METHOD OF CHOOSING GROUPS AND SUBJECTS 2

- Subject Areas 3

READING SOURCES 4

INFORMATION SOURCES 7

- General Topic Areas 7
- Specific Topic Areas 8

COMMUNITY LEARNING SOURCES 9

THE ROLE OF THE INSTRUCTOR 10

FACILITIES 11

SCHEDULING 12

GROUP PLANS 13

- Information and Instructions for Study Groups 15
- Subject Area Questions for Groups 17
  - Air Pollution 17
  - Community Planning and Development 18
  - Lumbering and Related Industries 19
  - Natural Resources 20
  - Pesticides 21
  - Population 22
  - Skagit Valley Geography 23
  - Solid Waste Disposal and Recycling 24
  - Water Pollution 25
  - Wildlife Management 26

UTILIZATION OF "EXPERTS" 27

EVALUATION 27

ENVIRONMENTAL EDUCATION CONCEPTS 29

APPENDICES

- Appendix A. Student Correspondence 37
- Appendix B. Student-Originated Information 49

Appendix C. Resource Bibliography 59
Appendix D. Student Papers on Speakers, Field Trips, and Movies 83
Appendix E. Excerpts from Group Plan Research 93

AN ENVIRONMENTAL APPROACH TO EIGHTH GRADE SCIENCE

PURPOSE

Outlined here is a method of teaching eighth-grade science with an environmental perspective. The ideas and concepts covered here are those which may be found in any junior high science curriculum, but the importance of this approach lies in its environmental relevance. Rather than teaching specific lessons or units on the environment or ecology, the normally covered areas of study are integrated with environmental concepts. This should be done in all areas of study, not just science.

This particular approach to eighth-grade science is intended to be: (1) process oriented, (2) field oriented, (3) problem oriented, and (4) relevant to the local community.

This program is conducted as a directed study, similar to those found in institutions of higher learning. The class is divided into groups of three or four. The members of each group strive to become "experts" in their particular subject area. The experts then proceed to inform or "educate" the rest of the class in regard to their subjects. This method can be considered an extension of the "each one teach one" theory.

INSTRUCTOR ORIENTATION SOURCES

Several books are listed here which will be quite helpful to the instructor trying to become familiar with the rationale behind this program and its environmental ramifications.

Commoner, Barry. Science and Survival. Ballantine Books, Inc., New York, 1963.

This book is helpful in pointing out how important it is that science be taught in relation to knowledge and activity in non-scientific terms. The interrelationships and interdependencies of scientific thought and action with other modes of thought and action such as the social and the ethical, is clearly revealed. Commoner also demonstrates how man has unleashed vast forces without knowledge of what the long-range effects on the environment may be.

Educational Policy Research Center, Stanford Research Institute. Alternative Futures and Educational Policy, Memorandum Report EPRC 6747-6. Stanford Research Institute, Menlo Park, Calif., 1970.

This report shows the importance of environmental education in regard to possible alternative futures which we may have here on this planet.

Silberman, C.E. Crisis in the Classroom. Random House, New York, 1970.

Silberman takes a critical look at the American school system and provides very worthwhile alternatives regarding what can and should be done in the classroom.

Terry, Mark. Teaching for Survival. Ballantine Books, Inc. New York, 1971.

What values, ideas, and processes are environmentally detrimental? Terry looks at the school and the classroom from an environmental point of view.

METHOD OF CHOOSING GROUPS AND SUBJECTS

A list of subject areas is presented by the instructor to the class and a very brief description of what each subject area might involve is given. The students are then given several days to think about which subjects they would prefer to study. At the end of this time, a discussion of particular subject areas may be appropriate in order to modify or choose areas which might better fit the interests and capabilities of the students and the community.

Each student is asked to list his first three choices in order of preference. These are then listed by subject area, and the student's name, followed by the number of his preference, listed below the subject area. Obviously, some areas will be more popular than others and will attract more choices. Therefore, a certain amount of juggling may be necessary, but with three choices the student will usually get one of his preferences.

Each group is set up with at least one boy and one girl; in other words, no group consists of all boys or all girls. Certain combinations of students are avoided for reasons of discipline and concentration. Strong leaders are grouped with slow students so that a group will not be composed of all high achievers or all low achievers.

The experience of functioning within heterogeneous groups is far more realistic to later community, vocational, or higher education situations than would be a select, homogeneous grouping. The experience of working for an extended period of time in groups set up in a heterogeneous form and with group task expectations enables the individuals to learn cooperation and group decision-making skills and increases their tolerance of and respect for other individuals.

Subject Areas

Solid waste disposal and recycling

Population

Air pollution

Water pollution

Natural resources

Pesticides

Community planning and development

Wildlife management

*Skagit Valley geography

*Lumbering and related industries

The concepts and materials which the student is normally expected to have mastered upon completion of junior high science are kept in mind in the choice of these subject areas, as well as the problems of environment which are most relevant to our geographical area.

READING SOURCES

Each group is provided with a reading which is used to familiarize the group with its subject area. The reading sources can be adapted from whatever the instructor has available or can gain access to.

A reading source which questions the status quo is sought and used when possible (e.g., Silent Spring). Some subject areas do not as yet have suitable materials available for eighth graders, so a particular chapter in the text or other suitable book may be used and supplemented. Paperbacks are quite readily available, economical, do not resemble textbooks, and as a result are quite well suited for this type of program.

Even though these books may not be available in the school, the city library probably has them. If it doesn't, the teacher may suggest that the library obtain them. This is one way of involving someone from the city library in the environmental education process. It also makes these reading sources available to the community as a whole.

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*These two subject areas are adapted to a particular locale in Western Washington State and can easily be changed to be relevant to any specific geographical area (e.g., Hudson River Valley geography; fishing and related industries).

A small library within the classroom is a necessity. Here other books relating to the subject areas are kept and may be checked out by students. This arrangement will often involve the sharing of materials with people from other groups, and necessitates cooperation. The makeup of the book list should point out the relationship of science to other areas of thought. A suggested listing of reading material for the classroom library follows.

Bernarde, Melvin. *Our Precarious Habitat*.

Carson, Rachel. *Silent Spring*.

Commoner, Barry. *Science and Survival*.

DeBell, Garrett. *The Voter's Guide to Environmental Politics*.

——————. *The Environmental Handbook*.

Ehrlich, Paul. *How to be a Survivor*.

——————. *The Population Bomb*.

Marine, Gene. *America the Raped*.

Marx, Wesley. *The Frail Ocean*.

Odum, Eugene. *Ecology*.

Swatek, Paul. *The User's Guide to the Protection of the Environment*.

Terry, Mark. *Teaching for Survival*.

Udall, Stewart. *The Quiet Crisis*.

Editors of *Fortune* Magazine. *The Environment*.

BSCS Green version, *High School Biology*.

This list is far from complete. The greater the variety and range of reading sources that are available, the more objective the group can be in its research. Many, many books and pamphlets are now available which deal with any and all of the subject areas.

The following reading sources pertain to the individual subject areas:

Air pollution: Bernarde, Melvin A. Our Precarious Habitat, Ch. 10. W. W. Norton and Co., Inc., New York, 1970.

Community planning and development:
DeBell, Garrett. The Environmental Handbook, pp. 182-197; 234-253. Ballantine Books, Inc., New York, 1970.

Lumbering and related industries:
American Forest Products Industries, Inc. Trees for Tomorrow. Washington, D.C.

Natural Resources:
Schneider, Herman, and Schneider, N. Science and Your Future, Ch. 14, Resources for More People. D. C. Heath and Co., Boston, 1964.

Pesticides: Carson, Rachel. Silent Spring. Fawcett Publications, Inc., Greenwich, Conn., 1962.

Population: Ehrlich, Paul. The Population Bomb. Ballantine Books, Inc., New York, 1968.

Skagit Valley geography:
Schneider, Herman, and Schneider, N. Science and Your Future, Ch. 7, Exploring Our Country. D. C. Heath and Co., Boston, 1964.

Solid Waste Disposal and Recycling:
Bernarde, Melvin A. Our Precarious Habitat, Ch. 9. W. W. Norton and Co., Inc., New York, 1970.

DeBell, Garrett. The Voter's Guide to Environmental Politics, Ch. 1. Ballantine Books, Inc., New York, 1970.

Stewart, George R. Not So Rich as You Think, Ch. 6-10. The New American Library, Inc., New York, 1967.

Water Pollution:
Bernarde, Melvin A. Our Precarious Habitat, Ch. 7-8. W. W. Norton and Co., Inc., New York, 1970.

Wildlife Management:
Laycock, George. America's Endangered Wildlife. Grosset and Dunlap, New York, 1969.

INFORMATION SOURCES

A list of organizations which provide environmental information is made available to the students after a brief discussion on the function of each organization. The students decide which organizations they want to write to. School envelopes and stamps can be used; the information which will be received is not for individual use but is material for the group and the entire class. It is important that the instructor check each letter for content in order to avoid unnecessary complications and to insure clarity of the request. (Written requests and responses from the test project may be found in Appendix A.)

A copy of The Conservation Directory, available through the National Wildlife Federation, is of immeasurable value in finding organizations and sources specifically suited for each subject area.

The sources of information are provided by the instructor. The student's use of the information acquired through replies and the manner in which he informs the rest of the class of the content of the replies are two of the criteria for evaluation.

Sources for General Topics

The Sierra Club
Mills Tower
San Francisco, California 94104

The National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036

Environmental Action
2000 P Street, N.W.
Washington, D.C. 20036

The National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Friends of the Earth
451 Pacific Avenue
San Francisco, California 94133

The John Muir Institute for Environmental Studies
8016 Zuni Road, S.E.
Albuquerque, New Mexico 87108

The League of Conservation Voters
c/o Friends of the Earth
917 Fifth Street, N.W.
Washington, D.C. 20005

Committee for Environmental Information
438 N. Skinker Boulevard
St. Louis, Missouri 63130

Sources for Specific Topics

Population

Zero Population Growth
367 State Street
Los Altos, California 94002

Emerson Foote, Chairman
Campaign to Check the Population Explosion
60 East 42nd Street
New York, New York 10017

Dr. George Denniston
Population Dynamics, Inc.
13201 9th, N.W.
Seattle, Washington

Solid Waste Disposal and Recycling

Lucky Lager Brewing Company
1615 Columbia
Vancouver, Washington

Reynolds Aluminum Company
2819 1st Street
Seattle, Washington

Coca-Cola Bottling Company
1150 124th, N.E.
Bellevue, Washington

Kaiser Aluminum Company
5975 E. Marginal Way, S.
Seattle, Washington

Pepsi-Cola Bottling Company
2300 26th, S.
Seattle, Washington

U.S. Department of Health, Education, and Welfare
Bureau of Solid Waste Management
Washington, D.C.

COMMUNITY LEARNING SOURCES

A primary function of this program is to expand the learning sources utilized in the educational process. For many years now resources within the social and business community have been only randomly and haphazardly used by the schools, and even then have been used at a level far from their fullest potential.

Students must be encouraged to the highest possible extent to draw upon and work with these people. This does not mean that a speaker is brought in for one session and the matter is left at that. It is far better that the students visit the person whom they wish to talk to at his place of employment or home. This puts the visit on a more personal basis and the students have the opportunity to actually experience the environment they are studying, whether it is the city sewage plant, the local wildlife refuge, or the county extension agent's office.

Examples of projects students may undertake in utilizing community learning sources are:

- visit a city council meeting dealing with community expansion and sewer problems;
- attend and tape record the proceedings of a public hearing dealing with the ecological consequences of raising a dam;
- work in the field with the state game department in banding ducks;
- interview the county agent in regard to the kinds of pesticides used in the area;

- visit with the county commissioners and discuss the solid waste problems of the county.

As you can see, the possibilities are unlimited. It is far better if the students arrange for their own transportation and meetings and are not accompanied by an adult in the actual session. This prevents the student from relying on the adult to ask the questions and forces the resource person to talk directly to the students.

With the rising cost of public education, fewer monies are being made available for large group field trips. Large amounts of money can be saved by having students take small group trips after school, either with parents or the instructor; this procedure provides as well for more individualized instruction, and more field trips. Trips of this nature also involve the parent in the learning process and the problems of the community.

THE ROLE OF THE INSTRUCTOR

The primary role of the instructor is that of facilitator. Probably the best way to describe his role is that he does nothing for the students or group which they can possibly do for themselves. Adherence to this rule of thumb is of the utmost importance, from the smallest detail of phoning the operator for the address of a company to the arranging of a class field trip to arranging for a speaker to be brought in. The students must do it themselves. If this is to be a process-oriented program, we must allow the student to experience and learn the entire process.

Students order their own movies from the county film library, contact their own speakers, and arrange for field trips with the coordination of the instructor. With ten different groups, this keeps the instructor busier than would a traditional situation, primarily in listening to and discussing ideas, projects, presentations, possible trips and speakers, and other matters with the small groups.

The instructor also has access to resources which the students do not have. These materials are made available for use by the groups, but are not integrated directly into the program by the instructor. The instructor may need to discuss thoroughly the use of a particular resource with a group prior to presentation, but the group determines whether or not and how to use that piece of material.

A lesson taught by the instructor may be necessary for complete understanding of a particular concept. This kind of procedure should be avoided as much as possible, and employed only when absolutely necessary. Discussion of materials with the group prior to the group's presentation of the materials should reduce the amount of lecturing on the instructor's part.

FACILITIES

Needless to say, with ten different groups progressing in innumerable directions simultaneously, the classroom will vary in structure from the traditional situation, but a traditional classroom is easily adapted for use in this program.

With groups working on bulletin boards and displays, discussing, experimenting, and moving in and out of the room, it is important that a place be provided where reading and small group planning and discussion can take place. A small room adjacent to the classroom would be ideal, but is a convenience which few instructors enjoy. Tables are better suited for the program than desks. Work in groups is far easier around a table than if the individual students have to sit at separate desks. It is also much simpler to work on group projects if larger surface areas are available, as opposed to the smaller surface areas of separate desks.

The school library is invaluable in several respects. First of all, it is an excellent place for students in groups to read and discuss. Also, most libraries are equipped as media centers. Groups can use this area to view, review, or preview movies, filmstrips, tapes or slide-tape presentations which may be of value. (See Sedro-Woolley Project Report #4, "The Role of the Library in Environmental Education," by H. Armstrong.)

Close coordination with the librarian is of the utmost importance. Of all the staff in the school, none is more knowledgeable about available information and resources, especially in regard to current and newly published or produced material.

Materials within the classroom itself must be stored or arranged in such a manner that they are easily accessible to groups. Much time is lost by the instructor's having to run from locked storeroom to locked closet obtaining materials for different groups. Responsible use of limited materials is a valuable social learning in itself.

SCHEDULING

A block or semi-block schedule serves the needs of this program far better than the standard six or seven fifty-minute period day. Operating within a two-hour block allows for much more freedom from the classroom. Short visits to the community by the class or small groups are made possible, such as a visit to the city sewage treatment plant or a group discussion with a city councilman. This block scheduling also makes possible the use of speakers and community resource people without fear of running out of time or into the next period. Additional time is gained, when needed, by placing these blocks on either side of the lunch period.

Because of district-wide scheduling it is sometimes difficult to work in a schedule of blocks every day of the week. Utilizing block scheduling on Tuesdays and Thursdays, for example, is quite satisfactory as far as arranging speakers, trips, and other activities.

The primary difficulty in implementing a block scheduling program, if this type of scheduling does not exist, is in moving fellow teachers to change from a traditional scheduling pattern. Many teachers have taught in 45- or 50-minute period situations for so long that they are quite apprehensive about any change. In such a case, the instructor trying to bring about a change in scheduling must proceed carefully and tactfully. A trial period of several weeks is usually enough to convince a reluctant colleague that this schedule serves his needs as well as yours.

GROUP PLANS

Each group is given a "group plan" which is unique to its subject area. The plan involves a series of from five to ten very general questions. These questions serve as areas of research within a given subject. Again, what is done with these group plans--how they are developed, researched, and presented--is the responsibility of the group.

The group plans cover the following topics within each particular subject area:

A. Define the subject area.

B. What is the problem, especially in relation to our local area?

C. How does the problem affect plants and animals?

D. How does this problem affect man?

E. What local, state, and federal agencies are responsible for and can control this problem?

F. What private organizations are concerned with this particular problem or area?

G. What is the future of this particular problem or area if current rates or trends continue?

H. What alternatives do we have?

I. What can the individual do?

Obviously, these questions may be adapted to fit a particular locale, or problems within a particular community or area.

The following question package is distributed to each student in the class, so that each has a copy of his own group plan, of plans of the other groups, and the general directions. This aids the student in knowing what materials he or she is responsible for.

The instructor does not necessarily have to know the answers to all the questions. His job is to help the students ask the right questions and to search along with them for the answers. The instructor's role is also to impose "quality control" on the findings, which is done through his evaluation.

Purpose of Your Group

A. To become informed about your subject area, to become an "expert" on that subject.

B. To inform the rest of the class about your subject.

A.

In becoming informed, your group can use the following resources:

1. Newspaper articles
2. Magazines
3. Speakers
4. Group field trips (after school or on Saturdays)
5. Books
6. People in the community
7. Correspondence with agencies, companies, or individuals.
8. Movies or filmstrips
9. Anything else you may find appropriate

Your group will be given a specific reading source to help familiarize you with your subject. After you are familiar with it, you may begin relating this knowledge to the Skagit Valley and Burlington.

To help you in your discovery of your subject area, your group is furnished with a short set of very general questions. What you do with these questions, how you develop them, and the initiative, creativity, and thought you apply to them are the things upon which your final evaluation will be based.

B.

To inform the rest of the class, you may consider the following:

1. A scrapbook containing articles, drawings, diagrams, pamphlets, or anything else connected with your subject area which you may wish to include. Subject matter directly related to the Skagit Valley should be kept separate from national items.

2. Bulletin boards. These are informative as well as appealing to look at.

3. Class presentations. These may be in the form of an experiment, a demonstration, or a talk on something in your subject area.

4. Movies. Various sources are available. Find your own.
5. Outside speakers. You find them.
6. Whole class field trips. Money may limit these.
7. Displays. These may be in the classroom, in the school display case, or in the community.
8. Handouts. These might go to the class, the school, teachers, or the community.
9. Games. Games might familiarize people with your subject or with a problem related to it.
10. Anything else you think of which would be appropriate in informing the rest of the class about your subject.

Study group topics are as follows:

1. Solid waste disposal and recycling
2. Community planning and development
3. Wildlife management
4. Water pollution
5. Air pollution
6. Population
7. Lumbering and related industries
8. Natural resources
9. Skagit Valley geography
10. Pesticides

Various sources of information have been provided. Using that information and informing the rest of the class about your subject is YOUR job.

It is suggested that you keep a notebook with a separate section for each of the above listed subject areas. You will be responsible for information presented by all other groups, and a notebook is a good way to keep track of your information and keep it organized.

Group Plan Air Pollution

Reading source: Our Precarious Habitat, Ch. 10, Melvin A. Bernarde.

1. What is air pollution?

2. What part and how much of the Earth's shell of air are we polluting?

3. What effect does air pollution have on human health, both mental and physical?

4. What are the effects of air pollution on plants and trees?

5. What agency (or agencies) is responsible for air pollution control in our area? In the state? In the nation?

6. What are the sources of air pollution in Skagit County?

7. What is being done by these sources of air pollution to control continued contribution?

8. How can the individual help to reduce air pollution?

Group Plan Community Planning and Development

Reading source: The Environmental Handbook, p. 182, "The Highway and the City"; p. 234, "The Recovery of Cities."

1. What are zoning and comprehensive planning?

2. What agencies are instrumental in community planning, zoning, and enforcement in Burlington? In the Skagit Valley?

3. Are Burlington and the Skagit Valley "planned"?

4. What steps must a citizen go through before constructing any sort of building in Burlington? Outside a town in the Skagit Valley?

5. What happens when community planning is not used?

Group Plan   Lumbering and Related Industries

Reading source: Trees for Tomorrow, American Forest Products Industry.
Conservation Field Study Tours, Society of American Foresters.

1. What types of trees are logged in the Skagit Valley? Western Washington? Washington State?

2. What various methods are used in harvesting and processing trees?

3. What agencies, companies, or departments control forests in the Skagit Valley?

4. What industries are associated with or considered part of the lumber industry?

5. How do projected needs of forest products compare to projected numbers of trees available?

6. What other uses do our forests have besides logging?

Group Plan Natural Resources

Reading source: Science and Your Future, Herman and N. Schneider, Ch. 14.

1. Our three general types of natural resources are renewable, limited, and cyclic. What natural resources fit into each of these categories?

2. What methods are used to obtain the best possible use of our natural resources?

3. What are the major natural resources of the Skagit Valley? Those used on a commercial basis? Those used otherwise?

4. What local, county, state, and federal agencies are responsible for the care of our natural resources?

5. What private organizations are responsible for the use and care of our natural resources?

6. What alternatives do we have to current uses of our natural resources?

7. What can the individual do to obtain the best possible use of our natural resources?

Group Plan Pesticides

Reading source: Silent Spring, Rachel Carson.

1. What is a pesticide?
2. More concern is being expressed each day regarding the use of pesticides and other chemicals. What are some of the pesticides and chemicals about which there is much concern?
3. What effects are pesticides and chemicals beginning to have on wildlife and plants for which they were not originally intended?
4. What do food chains, food webs, and cycles have to do with pesticides and chemicals?
5. What local, state, and federal agencies are responsible for the control and testing of pesticides and chemicals in the Skagit Valley?
6. What kinds of chemicals and pesticides are currently being used commercially in the Skagit Valley?
7. What kinds of chemicals and pesticides are currently being used in the home in the Skagit Valley?
8. What can the individual do to help reduce future chemical and pesticidal damage?

Group Plan Population

Reading source: The Population Bomb, Paul Ehrlich. High School Biology, BSCS Green version.

1. What demonstrations and experiments from the BSCS Biology Green version help you in your understanding of population?

2. What are past, present, and projected future world growth rates?

3. What are the implications if world population growth continues at projected rates?

4. What is the population growth rate of Skagit County?

5. What may be the result if Skagit County population growth continues at the projected rate?

6. What alternatives do we have, or what needs to be done?

7. What private and governmental agencies are concerned with the growth of population?

8. In what ways is growth controlled in plant populations? In animal populations (other than human populations)?

9. What can the individual do to help prevent a population crisis?

Group Plan Skagit Valley Geography

Reading source: Science and Your Future, Herman and N. Schneider, Ch. 7.

1. What is the basic composition of the earth?
2. What are the various ways by which the earth's surface is formed and changed? How are mountains made? How are mountains torn down?
3. What are the major geographic features of the Skagit Valley?
4. How was each of the features created, beginning with the first formed and following through the last?
5. What changes are occurring now?
6. How is man affecting these changes in the Skagit Valley?
7. How is man changing the Skagit Valley?

Group Plan   Solid Waste Disposal and Recycling

Reading source: Our Precarious Habitat, Melvin Bernarde, Ch. 9; The Voter's Guide to Environmental Politics, Garrett DeBell, Ch. 1; Not So Rich As You Think, George Stewart, Ch. 6-10.

1. What is solid waste?
2. What methods have been used in the past to take care of solid waste?
3. What new methods are now being used or considered as alternatives in the disposing of solid wastes?
4. How is solid waste disposed of in Burlington? In Skagit County?
5. What problems now exist in Skagit County in regard to solid waste disposal?
6. What alternatives are open to Skagit County, or are being considered, for solid waste disposal?
7. What can the individual do to reduce the amount of solid waste accumulation?

Group Plan Water Pollution

Reading source: Our Precarious Habitat, Melvin Bernarde, Ch. 7-8.

1. What is water pollution?
2. What effect does water pollution have on lakes, rivers, and streams?
3. What effect does water pollution have on human health, both mental and physical?
4. What is the effect of water pollution on plants and trees?
5. What agencies are responsible for water pollution control and quality at the local, county, state, and federal levels?
6. What are the types and sources of water pollution in Skagit County?
7. What is being done by the sources of water pollution in Skagit County to control their continued contribution?
8. How can the individual help prevent or reduce water pollution?

Group Plan Wildlife Management

Reading source: America's Endangered Wildlife, Laycock. Pamphlets from various agencies.

1. What local, state, and federal agencies work with wildlife in the Skagit Valley?

2. What private organizations are concerned with the management of wildlife?

3. In what ways is wildlife "used"?

4. What are the major types of wildlife that these agencies work with in the Skagit Valley?

5. What other kinds of wildlife do we find in this area, and what, if anything, do the agencies have to do with them?

6. What are "endangered" species?

7. What wildlife species in the Skagit Valley can be considered an endangered species?

8. What effect has man had on Skagit Valley wildlife?

UTILIZATION OF "EXPERTS"

The expertise which the groups gain may be utilized in many ways. The first and foremost responsibility of the group lies in informing the rest of the class about its particular subject area. The group can also serve as a learning source for lower grades, as speakers and as information sources. The individual can serve as an "expert" in his own home, and the "experts" can give presentations, either individually or in groups, before local clubs and organizations.

Each group can write one section of a newspaper series dealing with the community and the environment. The local newspaper is usually quite receptive to this type of project.

EVALUATION

Evaluation is an area in which each instructor must adopt what best suits his standards. The evaluation process should take into consideration the following points:

- How does the group function as a group?
- How does the individual contribute to the proper functioning of the group?
- What has the group done with its materials and information (presenting and informing)?
- The individual should not be compared with others within the group or class. Try to consider instead the growth or improvement of that individual compared with his level of awareness and achievement before he began the exercise.

Fact-opinion papers written by the students on each presentation or area given to the class serve as a form of evaluation, as well as a reference source, when returned to the students. Grades on bulletin boards, scrapbooks, and other presentations and forms of communication also aid in evaluating the group and the individual.

A tremendous help in recording and remembering the ideas and initiative of each group and student is a notebook in which the instructor can jot down various impressions as events occur. This is a far better method than trying to recall just what a certain student did during the first part of the program.

Basis for Evaluation - Sample

Group:

1. Scrapbook
2. Written report
3. Oral reports
4. Group cooperation
5. Work with outside resources
6. Imagination
7. Initiative

Individual:

1. Group grade
2. Test grades
3. Contribution to the group
4. Cooperation within the group
5. Improvement related to earlier achievement level

ENVIRONMENTAL EDUCATION CONCEPTS

The following list of fundamental concepts dealt with in environmental education is taken from R. Roth, "Fundamental Concepts for Environmental Management Education (K-16)," in Outlines of Environmental Education, C. Schoenfeld, Ed., Denbar Educational Research Services, Inc., Madison, Wis., 1971.

1. Living things are interdependent with one another and their environment.
2. The management of natural resources to meet the needs of successive generations demands long-range planning.
3. Man has been a factor affecting plant and animal succession and environmental processes.
4. Environmental management involves the application of knowledge from many different disciplines.
5. Modern man affects the structure of his environment.
6. Esthetic resources and recreational facilities of economic and non-economic value are becoming increasingly important in leisure-time activities.
7. Man has the ability to manipulate and change the environment.
8. A knowledge of the social, physical, and biological sciences and humanities is important for environmental understanding.
9. Social and technological changes alter the interrelationships, importance, and uses for natural resources.
10. There are certain risks taken, and limitations experienced, when manipulating the natural environment.
11. Resource depletion can be slowed by the development and adoption of alternatives.

12. Environmental management has effects on individuals and social institutions.

13. Man's need for food, fiber, and minerals increases as populations expand and levels of consumption rise.

. . . . . .

18. Increased population mobility is changing the nature of the demands upon some resources.

19. Options available to future generations must not be foreclosed.

20. A variety of institutional structures are involved in planning and managing the environment.

21. Hunting regulations are useful in maintaining and restoring populations as well as in distributing the game harvest.

22. Multiple use is a practice in which a given land area functions in two or more compatible ways.

. . . . . .

24. Architecture can be one of the positively persuasive influences in developing a congenial environment.

25. Zoning is a practice in which land uses are prescribed based upon value judgments regarding the needs of society.

. . . . . .

28. The economy of a region depends upon the utilization of its natural, human and cultural resources over time.

29. Economic efficiency does not always result in conservation of a natural resource.

30. The distribution or location of resources in relation to population, technological, and economic factors are critical to problems of resource conservation and use.

31. The political and economic strength of a country is in part dependent upon its access to domestic and foreign resources and international relationships.

32. Conservation policy is determined by the interaction of science and technology; social and political factors; and esthetic, ethical, and economic considerations.

33. Conventional cost-benefit analyses do not always result in sound conservation decisions.

34. A sound natural resource policy is dependent upon a flexible political system, pragmatically appraising and reappraising policies and programs in terms of their effect upon the public interest and in light of scientific knowledge about the natural resources.

35. Consumption practices are constantly being expanded by our ability to produce and create wants and markets, which affects the rate of resource use.

36. Individuals tend to select short term economic gains, often at the expense of greater long-term environmental benefits.

. . . . . .

40. Choices between needs (essentials) and wants or desires (nonessentials) are often in conflict.

. . . . . .

44. Safe waste disposal, including the reduction of harmful and cumulative effects of various solids, liquids, gases, radioactive wastes, and heat, is important if the well-being of man and the environment is to be preserved.

45. Pollutants and contaminants are produced by natural and man-made processes.

46. Increasing human populations, rising levels of living and the resultant demands for greater industrial and agricultural productivity promotes increasing environmental contamination.

There is no guarantee that a group will uncover all of the aforementioned concepts. This is just a listing of the ideas and concepts which may be uncovered by the students in the process of this program. With the aid of the instructor and other resource people, the great majority of these concepts, plus many more, will be unveiled by the students. The primary function of this listing is to illustrate the potential of such a program.

Following each of the subject area titles below is a series of numbers which correspond to the numbers of Roth's environmental concepts. For example, the number 1 following "solid waste disposal and recycling" tells us that the concept "living things are interdependent with one another and their environment" is contained within that particular subject area and group plan.

Entire program:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 18, 19, 20, 21, 22, 24, 25, 28, 29, 32, 33, 34, 36, 44, 45, 46
Solid waste disposal and recycling:	1, 2, 4, 5, 7, 8, 9, 11, 12, 13, 18, 19, 20, 28, 29, 32, 34, 36, 44, 46
Population:	1, 6, 11, 12, 13, 18, 19, 20
Air pollution:	1, 4, 5, 9, 11, 12, 13, 18, 19, 20, 29, 34, 36, 45, 46
Water pollution:	1, 3, 4, 5, 6, 7, 9, 11, 12, 18, 19, 20, 22, 29, 32, 34, 36, 45, 46
Wildlife management:	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 18, 19. 20, 21, 22, 29, 32, 34, 36, 45, 46
Community planning and development:	1, 4, 5, 6, 7, 8, 11, 12, 13, 18, 19, 20, 24, 25, 34, 36, 45, 46
Natural resources:	1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 18, 19, 20, 22, 28, 29, 32, 33, 34, 36, 45, 46
Lumbering and related industries:	1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 18, 19, 20, 22, 28, 29, 32, 33, 34, 36, 45, 46

Pesticides: 1, 2, 3, 4, 5, 10, 11, 12, 19, 20, 29, 36, 45, 46

Skagit Valley geography: 1, 4, 5, 6, 7, 9, 11, 12, 13, 19, 20, 45, 46

APPENDICES

Appendix A.	Student Correspondence
Appendix B.	Student-Originated Information for Distribution
Appendix C.	Resource Bibliographical Information
Appendix D.	Student Papers on Speakers, Fieldtrips, and Movies
Appendix E.	Excerpts from Group Plan Research

APPENDIX A. STUDENT CORRESPONDENCE

Included are examples of the type of letter which the groups used in soliciting information, and the responses to some of those letters. The responses on pages 46 and 47 are included to show student involvement outside the classroom in concern over environmental issues.

March 12, 1971
1781 Cook Road
Burlington
Washington
98233

Washington State University
% School of Agriculture
Pullman, Washington

Dear Sirs,

I am doing a directed study of pesticides and I was wondering if you could give me any information on the uses and misuses of Pesticides. If you do not have this information any addresses you have for more information would be appreciated.

Thank-you
Sincerely Yours,
Peggy Beitler

Cooperative Extension Service
WASHINGTON STATE UNIVERSITY
Pullman, Washington 99163

Extension Work in Agriculture and Home Economics in cooperation with the United States Department of Agriculture.

It is a pleasure to send the enclosed material which we hope meets your needs.

Sincerely yours,

John P. Miller

John P. Miller
Director

FRIENDS OF THE EARTH
451 PACIFIC SAN FRANCISCO CALIFORNIA 94133

Dear Friend:

Many inquiries come to us daily, and although they ask for different things they express the same concern: "we care very much about the world we inhabit and we are concerned about the future we'll inherit." Some of you ask about air and water pollution. Others want to know if there will be wilderness left to explore and if that wilderness will contain wildlife. A few of you need some help with your reports. Most of you want to know how you can help.

We share your concern and we are trying to do something. We try to keep you informed of what goes on. We cannot answer each letter because, fortunately, many more people are concerned and write to us than work for Friends of the Earth. But we do publish a monthly newspaper called Not Man Apart to keep you informed of environmental news. We also publish paperback books on specific subjects such as defoliants, sonic booms, nuclear power plants and user's and voter's guides to the environment. The purpose of these is always the same, to give you the facts and call you to action.

Whether you asked to help us or asked us to help you, we need your help if we are to bring about change. You can help by keeping informed, by urging your parents and friends to do the same and by joining together in action, following our suggestions or discovering your own new ways.

You can help by walking, by riding bikes, by recycling, by selective buying--in short by adopting a life style which is in harmony with the earth.

You can also help by urging your parents to invest in your future by joining organizations such as Friends of the Earth. Their memberships and contributions will enable us to continue to work for clean air and water, more wild places and wildlife to inhabit these.

For your report information you will find libraries the best source. Libraries have become increasingly aware of the public's concern and are adding environmental information to their shelves. You can also send away for information put out by the Scientists' Institute for Public Information, 30 E 68th Street, NYC 10021. For your debates get the Forensic Quarterly (The Nuea Discussion and Debate Source Book, environmental issues, University of Oregon, Rm. 68, Prince Lucien Hall, Eugene, Oregon). You can also read our books and newspaper. But for the action, the change, you--like us--have to begin at home. We, at Friends of the Earth, are fighting hard to remember and remind that this planet earth is our only home.

We hope you join with us.

I hope all these kids are in one class only - we thought it would be a waste of resources (paper) to send each student a letter as we haven't anything that specific for each area of concern.

Committed to the preservation, restoration, and rational use of the ecosphere

SAN FRANCISCO NEW YORK WASHINGTON HONOLULU ALBUQUERQUE ANCHORAGE LONDON PARIS

I return the letters so that you can make sure each student learns of this.

Population Dynamics

Incorporated Not for Profit

People / Resources

13201 - 9th Avenue N.W. • Seattle, Washington 98177 • (206) EM 4-4112

March 5, 1971

Miss Debbie Hobkirk
Box 505
Burlington
Washington 98233

Dear Debbie,

I am glad to learn that you are studying population, for I believe that it is terribly important to understand what more growth means.

I hope that there will be an opportunity for many millions of Americans to live in Washington - I just hope that they dont do it all at the same time. More people means more pressure on the land to provide more food for these people. It means more houses, and more land for housing, instead of for other purposes. It means crowded schools, especially in the cities. But you might think that there is lots of land around Burlington that seems to be going to waste. The ecologists are trying to tell us that it its not - every bit of it is already being used for some purpose - to support a forest, to provide food for humans. Much of the land is there for wilderness. Its usefulness to man may not be readily apparent but it is there.

You may say that there are not too many people near you. You must remember that it is the small towns of America that have created too many people in the cities by migrating there.

There is a solution - every family must have no more than two children. This is much better than having everyone living worse and worse and worse. So please study population carefully for the next few years, so you will understand it well, and know the problems that too many people will create for your children.

With warm best wishes,

George Denniston MD

George C Denniston M.D.
Vice President

SKAGIT COUNTY
COOPERATIVE EXTENSION SERVICE
COURTHOUSE [redacted] • MOUNT VERNON, WASHINGTON 98273 • TELEPHONE 336-2137

EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS IN COOPERATION WITH THE COLLEGE OF AGRICULTURE, WASHINGTON STATE UNIVERSITY AND THE U.S. DEPARTMENT OF AGRICULTURE

March 8, 1971

Debbie Mitchell
1209 Curtis Street
Burlington, Wash. 98233

Dear Debbie:

Your question about the changes in the physical environment in the Skagit Valley is quite comprehensive. We do not have any publications that I could send that would be too helpful to you. We have one publication called "Skagit County Agriculture" that gives the history of the development in Skagit County. We have provided library copies to many schools but at this time we have only our file copies in the Extension Office in the Courthouse. You are welcome to come into the office between 8:30 a.m. and 4:30 p.m. each day to look through this publication.

The Soil Conservation Service may have some more specific information in regards to their work in diking and draining the Skagit flats. This has been one of the biggest physical changes in the area. The Soil Conservation Service is located at 1519 South 2nd Street in Mount Vernon.

I will try to relate to you some of the physical changes that have taken place with emphasis in the area of agriculture. The first agricultural white settlement was located on Fidalgo Island in 1859. In 1863 settlement was started in the delta area. At this time most of the delta area was heavily timbered. The people that started farming in the delta area found the soil very rich. When this became known there was great effort made to clear land to put it into agriculture. Most of the western part of the county was owned by timber companies. The clearing of land followed the logging of the timber. This was not true in all cases. I live on Fir Island and my neighbor, who was here when the original clearing took place of much of that area, tells me that much of the large fir trees there were cut down, sawed up and burned just to get rid of them to be able to clear the land.

A great system of drainage and diking districts has prevented the flooding and encouraged the removal of water so that the land can be more productive.

The question of how to handle the flooding of the river and how much additional diking and containment is necessary, is a big question of today. However, the original clearing of these forests, the diking of the river and draining of the land has provided millions of dollars of income to the people of Skagit County. You asked the question was this good or bad. I believe you should determine that answer.

There have been changes in the eastern end of the county primarily in the building of dams. This has covered much timber land but at the same time it has provided electric power and recreational facilities for many people. Although this is not designed for flood control, these dams do help some in preventing flooding when a few inches on the river level makes a difference between containing the river or the river going over it dikes.

A great deal of land is being taken for use by highways. You will note as you cross the valley floor that the highway is taking thousands of acres of some of the prime agricultural land. This is a considerable physical environmental change and this will continually put more pressure on this agricultural land for highways, commercial establishments and other businesses.

I have tried to point out a few of the physical enviornmental changes to help you identify how man has changed the Skagit Valley. I hope you are able to find the necessary information.

Sincerely,
SKAGIT COUNTY EXTENSION SERVICE

Jack T. Crawford

Jack T. Crawford
County Extension Agent

JTC:sjw

GEORGIA-PACIFIC
CORPORATION
P.O. BOX 1236 • BELLINGHAM, WASHINGTON 98225 • 206-733-4410

March 9, 1971

Miss Susie Miller
Route 4, Box 473-B
Sedro Woolley, Washington 98294

Dear Miss Miller:

The Bellingham Division of Georgia-Pacific recycles old used papers on a paper machine referred to as an "8-cylinder counterflow vat paperboard machine". To describe the workings of this machine and its auxiliary equipment would fill a book. We at Georgia-Pacific would rather invite you and your eighth grade class to visit the Paperboard Mill for a tour and a lecture which would give you an excellent understanding of how paper is recycled and the many technological and economic problems involved.

If your class decides they would like to do this, please call me at 733-4410, Georgia-Pacific, Bellingham, and I will make all the necessary arrangements.

Sincerely,

Warren Mowry
Division Sales Coordinator

REYNOLDS ALUMINUM
NORTHWEST PUBLIC RELATIONS

March 26, 1971

Miss Susie Miller
Route 4, Box 473-B
Sedro-Woolley, Washington 98284

Dear Susie:

We are pleased to know you found the material we sent you helpful.

Enclosed are six more copies of the pamphlet you requested.

Feel free to contact us at any time for additional information.

Cordially,

dixie Vice

(Mrs.)Dixie Vice
Secretary

DV

REYNOLDS METALS COMPANY
PORTAL OAKS
6629 N. E. 82ND AVENUE · PORTLAND, OREGON 97220 · 503/255-6132

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR
OLYMPIA

DANIEL J. EVANS
GOVERNOR

March 10, 1971

Dani Chopot
1833 Maple Drive
Burlington, Washington 98233

Dear Dani:

Thank you for your letter in support of the acquisition of the Pass Lake area by the Washington State Parks and Recreation Commission.

The State Parks Commission did, at its February 22, 1971, meeting take steps to obtain advance funds from The Nature Conservancy for the purpose of holding this property until funding is available through the State of Washington. The Nature Conservancy has contacted the owners of the land with regard to purchasing the property. It is my hope that an announcement will soon be made that the Heilman property has been acquired so that it might be preserved for the people of Washington.

Your interest in the preservation and conservation of this beautiful area is to be commended.

Sincerely,

Daniel J Evans

Daniel J. Evans
Governor

DJE:cs

HENRY M. JACKSON, WASH., CHAIRMAN
CLINTON P. ANDERSON, N. MEX.
ALAN BIBLE, NEV.
FRANK CHURCH, IDAHO
FRANK E. MOSS, UTAH
QUENTIN N. BURDICK, N. DAK.
GEORGE MCGOVERN, S. DAK.
LEE METCALF, MONT.
MIKE GRAVEL, ALASKA
GORDON ALLOTT, COLO.
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MARK O. HATFIELD, OREG.
TED STEVENS, ALASKA
HENRY BELLMON, OKLA.
JERRY T. VERKLER, STAFF DIRECTOR

United States Senate
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
WASHINGTON, D.C. 20510

March 5, 1971

Miss Sherri Erickson
109 South Section Street
Burlington, Washington

Dear Miss Erickson:

Thank you for your recent letter regarding the sale of the Pass Lake property.

Contrary to speculation this land has not been sold to a private developer. Charles H. Odegaard, State Parks Director, recently announced that the Nature Conservancy, a non-profit organization dedicated to the preservation of the environment, would advance funds to hold the property until the State could finance the purchase. In the interim the State will proceed with its recreational development.

As you may know, I sponsored the Land and Water Conservation Fund Act of 1965 which established a fund to assist state and local governments in acquiring and developing park and recreation areas. Monies provided by this Act have been used to purchase and develop over 65 recreational areas in our State. I am reasonably sure that the Land and Water Conservation Fund monies will also be used to purchase the Pass Lake property.

I appreciate your interest in this matter.

Sincerely yours,

Henry M Jackson

Henry M. Jackson, U.S.S.

HMJ:sb

APPENDIX B. STUDENT ORIGINATED INFORMATION FOR DISTRIBUTION

The following papers illustrate how the groups may use their expertise in informing the rest of the class and the general public about environmental issues. These publications were entirely student initiated, composed, and produced. Most groups producing publications also chose to distribute them throughout their neighborhoods, discussing the papers with the people as they went. The response from parents, teachers, and neighbors was overwhelmingly in favor of this type of activity.

Phosphates in Detergents

An Important Message:

Because many people are concerned about our environment, we are listing the phosphate contents of detergents. Phosphates, while they provide the "Cleaning Power" to your wash. . . are still one of the leading contributors of pollution and eutrophication of our streams and lakes

The lower the phosphate content, the less the product will contribute to this problem. If you care about what's happening to our environment and our wildlife, we urge you to PLEASE! buy a low phosphate detergent.

Detergent	%P	Detergent	%P
Ivory Flakes	0	FaB	34
Lux Flakes	0	Oxydol Plus	34
Cold Water All (liquid)	0	Punch	35
Diapear Sweet	0	AJAX	35
Pure Water	0	Concentrate All	36
Trend	6	Tide XK	38
Instant Fels	8	Cold Water All	35
Wisk	15	Cascade	40
Launder Maid Blue	25	Brust	45
Cheer	27	Drive	42
Surf	27	Salvo	51
Bold	28	Dash	60
Cold Power	29	Axion	62
Gain	29	Biz	70

Courtesy of the 8th grade Water Pollution Study Group

Miscellaneous Use

	%P
Snowy Bleach	22
Spic and Span	21
Mr. Clean	7
Arm & Hammer Soda	1

Laundry Soaps

Ivory Snow	Less than 1

Automatic Dishwater Compounds

All	45
Finish	43
Calgonite	42
Cascade	37
Amway	34

Liquid Dish Detergents

All liquids tested showed less than 1%

Conditioners

Calgon	76
Amway Water Softener	74

Light Duty

Whistles	Less than 1
Jet Spray	Less than 1
Lestoil	Less than 1
Pinesol	Less than 1

An Audubon Guide to PESTICIDE DO'S AND DON'TS*

Do not use combinations. Do not buy insecticides in mixtures, insecticides in herbicides, or fertilizers with either insecticides or herbicides in them.

Do not use mercury compounds or mercury treated seeds.

Avoid at all costs, the following long-lived, fat-soluble chemicals: Aldrin, Dieldrin, DDT, Endrin, Heptachlor. All of these tend to be magnified in natural ecosystems by being passed from one link to another in food chains, and thus poison the whole landscape. This has been the greatest ecological blunder of the generation.

THE PROBLEM	THE RECOMMENDATIONS
HOUSEHOLD PESTS	
ants	In old woodwork, dust desiccant powders into cracks along walls (silica gels like Dri-Die or SG67, or diatomaceous earths like Perma-Guard). For ant nests in lawn or ant pathways into buildings, a small amount of chlordane may be necessary. Always cover up treated areas. Use Diazinon for infrequent spray.
bedbugs, cockroaches, fleas, silverfish	Use desiccants (as above) or malathion or Diazinon, both short-lived phospate chemicals.
mosquitoes	Eliminate stagnant water; use pyrethrins and oil on standing water that cannot be eliminated to kill larvae (having established that they are present); use short-lived phosphates like abate (naled), Dibrom, malathion as adulticides.
termites	Chlordane (as for difficult ant problems)
wasps, hornets, etc.	Apply rotenone to nest after darkness and coolness have made the insects dormant, and cover tightly with cotton batting after generous dusting. Deftness and care are essential since these insects are dangerous when aroused.
GARDEN PESTS	
aphids	Can often be washed off; otherwise, use nicotine sulphate (Black Flag), pyrethrum, rotenone, malathion.

---

*The Audubon Society

caterpillars	Rotenone, Diazinon, methoxychlor, or the carbaryl Sevin.
chiggers	Malathion.
cutworms	Diazinon, Sevin.
earwigs	Try desiccants in dry places; chlordane for very difficult areas.
grasshoppers	Diazinon, Sevin
gypsy moths	In our opinion, this is an overrated forest pest. Officials in Pennsylvania, New Jersey, and New York are hysterical over it just now, but southern New England states who have lived with it have learned to relax. Occasional heavy defoliation may kill, at the most, one in twenty trees that would not have lived anyway, most often on ridgetops (or sandy areas) that produce nothing valuable as timber. This culling process actually benefits most Northeastern woodlands which are overstocked with oak. What is needed--and what the U.S. Forest Service has at last undertaken--is basic research on the ecology of gypsy moth/forest interactions. If your state or community has funds for gypsy moth control, insist that they support this research. If you can't dissuade the sprayers, insist on spot treatment only. Use Sevin.
Japanese beetles	Milky spore disease (from Fairfax Biological Laboratory, Clinton Corners, New York) for soil grubs; malathion or Sevin for adults.
lawn moths	Diazinon, Sevin
leafhoppers, leaf miners, leaf rollers	Diazinon
mites (red spiders)	oil spray, hot water
scale insects	Diazinon, malathion, Sevin
spittlebugs	Malathion, Sevin

thrips	Nicotine sulphate, Diazinon, malathion, rotenone
wireworms	Diazinon
wood borers	Diazinon

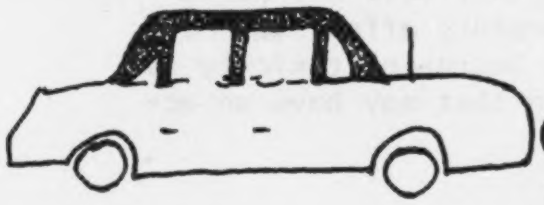
(Note: Diazinon (Spectracide) is a broad-spectrum, reasonably short-lived phosphate that does not build up in food chains. It is thus broadly effective. But, like Baytex, it has a peculiarly increased toxicity to birds; hence, do not spray a bush that may have an active birds nest.)

Courtesy of the 8th grade pesticide study group

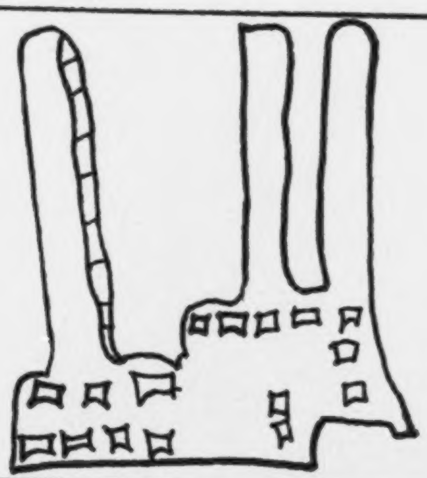
Air Pollution

Annual Emissions of major Pollutants in millions of Tons, As of 1966...

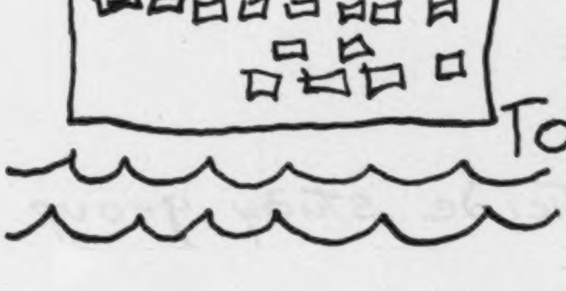
Total: 142 million Tons



	Tons
Carbon monoxide	66
Hydrocarbons	12
Nitrogen oxides	6
Sulfur oxides	1
Particulates	1
Total Automobile	86



Sulfur oxides	
Particulates	9
Hydrocarbons	6
Nitrogen oxides	4
Carbon monoxides	2
6 maj. industries	23



Sulfur oxides	12
Carbon monoxides	3
Nitrogen oxides	3
Hydrocarbons	1
Particulates	1
Total Electric Power	20

FISH ECOLOGY

Cornell University
Cons. 439

COMPARATIVE EFFECTS OF COMMON ORGANIC INSECTICIDES ON FISH

(Data based on lab experiments with fathead minnows)

Toxicant	96-hr TLm**
Endrin	1.0 ppb
Toxaphene	7.5 "
Dieldrin	16.0 "
DDT	32.0 "
Aldrin	33.0 "
Chlordane	52.0 "
Lindane	62.0 "
Methoxychlor	64.0 "
Heptachlor	94.0 "
EPN	0.20 ppm
Para-Oxon	0.33 "
Parathion	1.4 "
Tepp	1.7 "
BHC	2.3 "
Chlorothion	3.2 "
Systox	3.6 "
Sevin	6.7 "
Methyl parathion	8.3 "
Malathion	12.5 "
OMPA	121.0 "
Dipterex	180.0 "

**Concentration of the pesticide at which half of the fathead minnows died in 96 hours.

From Henderson, C., Q. H. Pickering, and C. M. Tarzwell, "The Toxicity of organic phosphorus and chlorinated hydrocarbon insecticides to fish," Biological Problems in Water Pollution 2:76-88.

APPENDIX C. RESOURCE BIBLIOGRAPHICAL INFORMATION

Most of the following information originated with the Sierra Club and is excellent as far as covering several subject areas in depth in the various media. This material should be of great value to the beginning teacher or any instructor trying to build a background of environmental information.

This listing should also be made available to the groups at the beginning of the project so that they will have access to the information through the entire period of the project.

BOOKS

BOOKS
and stuff

The User's Guide to the Protection of the Environment, by Paul Swatek, A Friends of the Earth/Ballantine Book. Paperback $1.25.

The Voter's Guide to Environmental Politics, Garrett DeBell, Ed., A Friends of the Earth/Ballantine Book. Paperback $.95.

These guide books published by Friends of the Earth bring a new and needed skepticism to both consumerism and politics. They are particularly valuable because they bring together in one place much formerly scattered material on living environmentally and how The System works.

The User's Guide tackles every aspect of living from home heating to detergents. Its thesis is "Every consumer decision you make has an environmental impact. Every time you visit the supermarket, buy a ticket to travel, choose a place to live your choices have an effect . . . on the quality of the air you breathe and the water you drink."

The User's Guide shows the consumer how he can say "no" to certain environmental insults and that he can make better decisions than the so-called experts. The book fails, however, to point out forcefully enough that the consumer is really prevented from making environmentally sound decisions most of the time because environmentally sound alternatives don't exist.

The Voter's Guide exposes a purposefully murky subject—the workings of government—and presents guidelines for those who would work within the system for environmental sanity. It provides practical, step-by-step instructions on how to influence congressmen and federal agencies. It is remarkable because it emphasizes the difficulty of being effective with Congress and the downright impossibility of getting anywhere with a federal agency.

Together these volumes are as comprehensive as any already on the environmental bookshelf. Although they assume a working knowledge of the environmental calamities confronting us the User's Guide contains a bibliography for those who would read further and the Voter's Guide contains a list of organizations which provide information and action on environmental problems.

For $2.20 plus tax these volumes make good biodegradeable gifts for everyone on your Christmas shopping list.

---Martha Wright

Both of these books are available To read in our environmental library.

WATER POLLUTION

1. Books

Community Action Program for Water Pollution Control 182 pp.
National Association of Counties
1001 Connecticut Avenue, N.W.
Washington, D.C. 20036 ($1.00)

Environmental Engineering: A Guide to Industrial Pollution Control
McGraw-Hill, Inc.
330 West 42nd Street
New York, N.Y. 10036 ($2.50)

Big Water Fight
(League of Women Voters Education Fund)
Stephen Greene Press
Brattleboro, Vt.

2. Reports

"Environmental Pollution: A Challenge to Science and Technology"
1966 60 pp. 20¢ I67.2:W29/2

"A Strategy for a Livable Environment"
1967 90 pp. 60¢ FS1.2:En8

"The Cost of Clean Water and Its Economic Impact"
1969 220 pp. $1.75 I67.1/2:969/v.1

"The Cost of Clean Water [series] Summary Report
1968 39 pp. 40¢ I67.2:C82/v.1

These are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Water pollution publications are listed in GPO price list PL51.

3. Booklet, pamphlets, reprints

"Water Pollution" [$1.00]	(SIPI)
"Focus on Clean Water"	(FWPCA)
"Public Information Materials" [bibliography]	(WPCF)
"Clean Water --It's Up to You" [very good]	(IWL)
"Citizen Action for Clean Water"	(CCCW)
"Who Pays for a Clean Strean Stream?"	(LWV)
"So You'd Like to Do Something about Water Pollution"	(LWV)

Abbreviations refer to government and citizen groups listed below.

4. Films

Film catalogs and films about water pollution can be obtained from:

Stuart Finley Productions
3248 Mansfield Road
Falls Church, Va 22041

McGraw-Hill Contemporary Films
330 West 42nd Street
New York, N.Y. 10036

Encyclopedia Britannica
Educational Corporation
425 North Michigan Avenue
Chicago, Ill. 60611

Extension Media Center
University of California
Berkeley, Calif. 94720

5. Newsletters (weekly)

Environmental Action Bulletin
Rodale Press, Inc.
Emmaus, Pa. 18049
($10.00/ yr.)

Air & Water News ($120.00/ yr.)
McGraw-Hill, Inc.
330 West 42nd Street
New York, N.Y. 10036

Conservation Report
National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036

Air/ Water Pollution Report ($90.00/ yr.)
Business Publishers, Inc.
Box 1067, Blair Station
Silver Spring, Md. 20910

6. Periodicals

Environment
Committee for Environmental Information
438 North Skinker Boulevard
St. Louis, Mo. 63103 ($8.50/ yr.)

Science (weekly)
American Association for the
Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005 ($12.00/ yr.)

Journal
Water Pollution Control Federation
3900 Wisconsin Avenue
Washington, D.C. 20016

Pollution Engineering (bi-monthly)
1301 South Grove Avenue
Barrington, Ill. 60010 ($12.00/ yr.)

7. Citizen Groups

Citizens Committee for Clean Water
105 East 22nd Street, Rm. 710
New York, N.Y. 10010 (CCCW)

Izaak Walton League (IWL)
1326 Waukegan Road
Glenview, Ill. 60025

League of Women Voters (LWV)
1730 M Street, N.W.
Washington, D.C. 20036

Scientists' Institute for Public
Information (SIPI)
30 East 68th Street
New York, N.Y. 10021

National Wildlife Federation (NWF)
1412 16th Street, N.W.
Washington, D.C. 20036

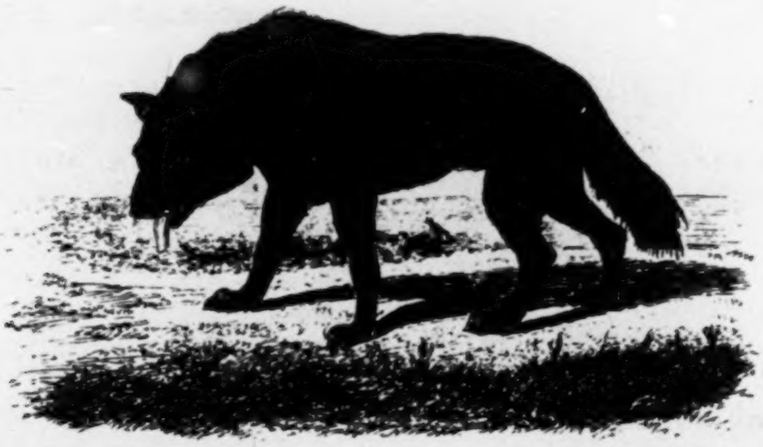
Water Pollution Control Federation (WPCF)
3900 Wisconsin Avenue
Washington, D.C. 20016

8. Government

Federal Water Pollution Control
Administration (FWPCA)
633 Indiana Avenue, N.W.
Washington, D.C. 20242

also
FWPCA
760 Market Street
San Francisco, Calif. 94102

INFORMATION SOURCES ON ENDANGERED SPECIES OF WILDLIFE



Defenders of Wildlife
1346 Connecticut Avenue, N.W.
Washington, D.C. 20036

World Wildlife Fund
910 17th Street, N.W.
Washington, D.C.

Help Our Wolves Live (HOWL)
Route 1
Wescott Woodlands
St. Paul, Minnesota 55410

National Audubon Society
1130 Fifth Avenue
New York, N.Y. 10028

International Union for Conservation
of Nature and Natural Resources
1110 Morges, Switzerland

Friends of the Sea Otter
Big Sur, California 93920

Check your local school and public libraries for books on endangered species and wildlife habitat including WILD SANCTUARIES: Our National Wildlife Refuges --A Heritage Restored by Robert Murphy. New York: Dutton, 1968.

WILDLIFE IN AMERICA. Peter Matthiessen. New York: Viking, 1959.

WILDLIFE IN DANGER. James Fisher, Noel Simon, Jack Vincent. Foreword by Harold Collidge of the International Union for Conservation of Nature and Natural Resources, Joseph Wood Krutch. New York: Viking, 1969. Lists with pictures of and text on endangered mammals, birds, reptiles, amphibians, fish, and plants from the files of IUCN authorities.

THE FRAIL OCEAN. Wesley Marx. New York: Ballantine, 1967.

RARE AND ENDANGERED FISH AND WILDLIFE OF THE UNITED STATES. U. S. Department of the Interior. Government Printing Office, Washington D.C. 20402.

MAN AND THE CALIFORNIA CONDOR. Ian McMillan. New York: Dutton, 1968.

SOURCE OF THE THUNDER: The Biography of a California Condor. Roger Caras. Boston: Little, Brown, 1970.

WORLD OF THE GRIZZLY BEAR. W. J. Schoonmaker. New York: Lippincott, 1968.

THE TULE ELK: Its History, Behavior, and Ecology. Dale R. McCullough. Berkeley: University of California Press, 1969.

Write your Congressman, your Senators and Secretary of the Interior Rogers C. B. Morton, Washington, D.C. 20240 with copies of letters to the President of the United States, The White House, Washington, D.C. 20006. Letters to your United States Senators should be addressed to: Senate Office Building, Washington, D.C. 20510; those to your Representative should be addressed to: House Office Building, Washington, D.C. 20515.

AIR POLLUTION

1. Books

Air Pollution Primer 104 pp.
National Tuberculosis and Respiratory Disease Association
1740 Broadway
New York, N.Y. 10019

Air Conservation 335 pp. ($8.00)
American Association for the Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

Community Action Program for Air Pollution Control 100 pp. ($1.00)
National Association of Counties
1001 Connecticut Avenue, N.W.
Washington, D.C. 20036

Environmental Engineering: A Guide to Industrial Pollution Control ($2.50)
McGraw-Hill, Inc.
330 West 42nd Street
New York, N.Y. 10036

2. Reports

"Environmental Pollution: A Challenge to Science and Technology"
1966 60 pp. 20¢ I67.2:W29/2

"A Strategy for a Livable Environment"
1967 90 pp. 60¢ FS1.2:En8

"Air Pollution Publications: A Selected Bibliography"
1969 522 pp. $4.50 FS2.24:Ai7/966-68

"Progress in the Prevention and Control of Air Pollution"
1968 85 pp. 30¢ 90-2:Sdoc92

"Digest of State Air Pollution Control Laws"
1968 556 pp. $2.75 Fs2.93:967

"Air Quality Act of 1967"
1967 97 pp. 30¢ 90-1:H.rp.728

"Automotive Steam Engine and Other External Combustion Engine"
1968 272 pp. $1.00 Y4.C73/2:90-82

"Automotive Air Pollution"
1967 13 pp. 90-1S.doc.47

These are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Air pollution publications are listed in GPO price list PL51.

3. Booklets, pamphlet, reprints

"Air Pollution" [$1.00]	(SIPI)
"The Revolt Against the Internal Combustion Engine"	(NAPCA)
"The Ambient Air"	(NAPCA)
"Physicians' Guide to Air Pollution"	(NAPCA)
The Air Quality Act of 1967"	(NAPCA)

4. Film catalogs and films about air pollution can be obtained from:

National Air Pollution Control Administration (NAPCA)
801 North Randolph Street
Arlington, Va. 22203

NcGraw-Hill Contemporary Films
330 West 42nd Street
New York, N.Y. 10036

Encyclopedia Britannica Educational Corporation
425 North Michigan Avenue
Chicago, Ill. 60611

Carousel Films, Inc.
1501 Broadway
New York, N.Y. 10036

5. Newsletters (weekly)

Conservation Report
National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036

Environmental Action Bulletin
Rodale Press, Inc.
Emmaus, Pa. 18049
($10.00/ yr.)

Air & Water News ($120.00/ yr.)
McGraw-Hill, Inc.
330 West 42nd Street
New York, N.Y. 10036

Air/ Water Pollution Report ($90.00/ yr.)
Business Publishers, Inc.
Box 1067, Blair Station
Silver Spring, Md. 20910

6. Periodicals

Environment ($8.50/ yr.)
Committee for Environmental Information
438 North Skinker Boulevard
St. Louis, Mo. 63103

Journal
Air Pollution Control Association
4400 Fifth Avenue
Pittsburgh, Pa. 15213

Science (weekly)
American Association for the
Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005 ($12.00/ yr.)

Pollution Engineering ($12.00/ yr.)
1301 South Grove Avenue
Barrington, Ill. 60010 (bi-monthly)

7. Citizen Groups

Citizens for Clean Air
40 West 57th Street
New York, N.Y. 10019

Citizens Against Air Pollution, Inc.
110 Roundtable Drive, 14-1
San Jose, Calif. 95111

Scientists' Institute for Public
Information (SIPI)
30 East 68th Street
New York, N.Y. 10021

Ecology Action
Box 9334
3029 Benvenue
Berkeley, Calif. 94709

8. Government

National Air Pollution Control
Administration
5600 Fishers Lane, Rm 17 B 31
Rockville, Md. 20852

also
NAPCA
50 Fulton Street
San Francisco, Calif. 94102

9. Air pollution is but part of the broader problem of resource usage and environmental quality. Books listed in the Sierra Club "Environmental Problems Bibliography" explore means and implications of solving the problems of air pollution. Articles found in Terracide and America's Changing Environment are especially to the point.

SIERRA CLUB, 1050 MILLS TOWER, 220 BUSH STREET, SAN FRANCISCO, CA 94104
FEBRUARY 1971

BIOCIDES

1. Pesticides

A. Books

Pesticides and the Living Landscape, Robert L. Rudd. University of Wisconsin Press, Madison, 1966.

Silent Spring, Rachel Carson. Crest Books, New York, 1962.

Since Silent Spring, Frank Graham. Houghton Mifflin, Boston, 1970.

B. Articles

"Blowing the Whistle on DDT," Sunset Magazine, August 1969.

"DDT in Mother's Milk," Saturday Review, May 2, 1970.

"Earth, Air, Water," Justin Frost, Environment Magazine, 2(6), July-August 1969.

"Pesticide Damage," Environment Magazine, 2(7), September 1969.

"Pyramiding Damage," Tony J. Peterle, Environment Magazine, 2(6), July-August 1969.

"You Can Buy Nerve Gas in the Grocery Store," Lloyd Linford, Earthtimes, 4, July 1970.

C. Films

Poisons, Pests, and People. Two parts, b&w, 30 minutes each. Contemporary Films, Inc., 267 W. 25th Street, New York, N. Y. 10001.

Silent Spring of Rachel Carson. CBS Reports, b&w, 54 minutes. McGraw-Hill Textfilms, 330 West 42nd Street, New York, N. Y. 10018.

2. Herbicides, Defoliants and CBW

A. Books

Defoliation, Thomas Whiteside. Ballantine Books, New York, 1970.

Science and Survival, Barry Commoner. Viking Press, New York, 1966.

The Ultimate Folly. Richard D. McCarthy. Alfred A. Knopf, New York, 1970.

B. Articles

"Chemical, Bacteriological (Biological) Weapons and Effects of their Possible Use," U Thant, speech before the United Nations General Assembly, July 1, 1969. United Nations Publication No. A/7575.

"Chemical and Biological Weapons," Matthew S. Meselson, Scientific American, 222(5), May 1970.

"Defoliating Vietnam," Time, February 23, 1968.

"The Destruction of Indochina," John Lewallen, Earthtimes, 4, July 1970.

"The Wind from Dugway," Environment, 2(1), January-February 1969.

C. Films

A Plague on Your Children. BBC, b&w, 72 minutes. British Broadcasting Corporation, c/o Peter M. Robeck and Co., 230 Park Avenue, New York, N. Y. 10017.

4. Information Agencies

Scientists Institute for Public Information
30 East 68th Street
New York, N. Y. 10021

Environmental Effects of Weapons Technology
Nuclear Explosives in Peacetime
Pesticides

Bureau of Land Management
U.S. Department of the Interior
Washington, D.C.

Food and Drug Administration
Department of Health, Education, and Welfare
Washington, D.C. 20250

State Departments of Agriculture

NOISE POLLUTION

An Introductory Reading List Emphasizing Potential Technical Solutions

Mecklin, John M., "It's Time to Turn Down all that Noise," Fortune, Oct. 1969

** Beranek, L. L., "Noise," Scientific American, Dec. 1966

"How Today's Noise Hurts Mind and Body," Medical World News, pp. 42-26, June 13, 1969

Jansen, G. "Effects of Noise on Health," German Medical Monthly, XIII, 9, 446-448, Sept. 1968

Von Gierke, H.E. "Effects of Sonic Boom on People: Review and Outlook" J. Acoust. Soc. Amer., 39, 543-550, May 1966

** Committee on the Problem of Noise, "Noise," Final Report, Presented to Parliament, July 1963. (Available from Her Majesty's Stationary Office, London).

Jet Aircraft Noise Panel, "Alleviation of Jet Aircraft Noise Near Airports," Report, Office of Science and Technology, Office of the President, March 1966

Report of ASEB ad hoc Committee on Noise, 1968, National Academy of Engineering, reprinted in "Civil Aviation: The eext Twenty Years," Aeronautics and Astronautics (Magazine), August 1968.

"Noise: Sound without Value," report of the Committee on Environmental Quality of the Federal Council for Science and Technology, Sept. 1968

A report on noise as a national problem, Noise Abatement Panel, Commerce Technical Advisory Board, Dept. of Commerce, Washington, D.C., to be published late 1968

** Proceedings, Conf. on "Noise as a Public Health Hazard," Dept. HEW & Amer. Speech & Hearing Assoc., 9030 Old Georgetown Road, Washington, D.C. 20014 (especially see McGrath, Dorn, "City Planning and Noise.")

Armed Services Manual, "Land Use Planning with Respect to Aircraft Noise," (AFM 86-5, NAVDOCKS P-98), October 1964

Meyer, Harold B. & Goodfriend, Lewis, "Acoustics for the Architect," Reinhold Pub. Co. N.Y. 1957

** Items of outstanding introductory value.

"Solutions to Noise Control Problems in the Construction of Houses, Apartments, Motels and Hotels," AIA File No. 39-E, Owens-Corning Fiberglas Corporation, Toledo, Ohio, 1963

Berendt, R.D., Winzer, G.E. and Burroughs, C.B., "A Guide to Airborne, Impact and Structure-Borne Noise Control in Multifamily Dwellings," FHA Report FT-TS-24, January 1968

Harris, C.H. ed., "Handbook of Noise Control, "McGraw-Hill Book Co., 1957
  Chapter 35: "Community Noise and City Planning"
  Chapter 36: "Community Reaction of Noise"
  Chapter 39: "Anti-Noise Ordinances"
  Chapter 40: "Noise Control Requirements in Building Codes"

Laws of 90th Congress, Public Law 90-411, "An Act to Amend the Federal Aviation Act of 1958 to Require Aircraft Noise Abatement Regulation, and For Other Purposes," July 21, 1968 (Appears in U.S. Code Congressional and Administrative News, August 15, 1968 (Code 8), pp. 2155-2156)

For further information (literature or status of legislation) contact Elizabeth Cuadra, Noise Abatement Coordinator, California Membership, Acoustical Society of America, 12416 Deerbrock Lane, Los Angeles, California 90049 (213) 472-8201.

SIERRA CLUB, 220 BUSH STREET, SAN FRANCISCO, CALIFORNIA 94104
JANUARY 1971

CONSERVATION AND ENVIRONMENTAL ORGANIZATIONS

General Conservation

Conservation Foundation
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

Federation of Western Outdoor Clubs
Box 548
Bozeman, Mont. 59715

Friends of the Earth
30 East 42nd Street
New York, N.Y. 10017

National Audubon Society
1130 Fifth Avenue
New York, N.Y. 10028

National Parks Association
1701 18th Street, N.W.
Washington, D.C. 20009

Nature Conservancy
1522 K Street, N.W.
Washington, D.C. 20005

Sierra Club
220 Bush Street
San Francisco, Calif. 94104

Wilderness Society
729 15th Street, N.W.
Washington, D.C. 20005

International Union for Conservation
of Nature and Natural Resources
1110 Morges, Switzerland

Conservation Education Association
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

Wildlife

Defenders of Wildlife
1346 Connecticut Avenue, N.W.
Washington, D.C. 20036

New York Zoological Society
630 Fifth Avenue
New York, N.Y. 10020

World Wildlife Fund
910 17th Street
Washington, D.C. 20006

National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036

Ducks Unlimited
Box 66300
Chicago, Ill. 60666

Izaak Walton League of America
719 13th Street, N.W.
Washington, D.C. 20005

Wildlife Management Institute
709 Wire Building
Washington, D.C. 20005

Trout Unlimited
5850 East Jewell Avenue
Denver, Colo. 80222

Environmental Problems

Committee for Environmental Information
438 N. Skinker Boulevard
St. Louis, Mo. 63130

Environmental Defense Fund
P.O. Drawer 740
Stony Brook, N.Y. 11790

Ecology Action
3029 Benvenue
Berkeley, Calif. 94709

Conservation Library Center
Denver Public Library
1357 Broadway
Denver, Colo. 80222

Water Pollution Control Federation
3900 Wisconsin Avenue, N.W.
Washington, D.C. 20016

Citizens for Clean Air
40 West 57th Street
New York, N.Y. 10019

Citizens League Against Sonic Boom
19 Appleton Street
Cambridge, Mass. 02138

Town-Village Aircraft Safety and
Noise Abatement Committee
196 Central Avenue
Lawrence, N.Y. 11559

Population

Planned Parenthood-World Population
515 Madison Avenue
New York, N.Y. 10022

Zero Population Growth
367 State Street
Los Altos, Calif. 94022

Professional

American Association for the
Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

Ecological Society of America
c/o Biology Department
Duke University
Durham, N.C.

"Solutions to Noise Control Problems in the Construction of Houses, Apartments, Motels and Hotels," AIA File No. 39-E, Owens-Corning Fiberglas Corporation, Toledo, Ohio, 1963

Berendt, R.D., Winzer, G.E. and Burroughs, C.B., "A Guide to Airborne, Impact and Structure-Borne Noise Control in Multifamily Dwellings," FHA Report FT-TS-24, January 1968

Harris, C.H. ed., "Handbook of Noise Control, "McGraw-Hill Book Co., 1957
- Chapter 35: "Community Noise and City Planning"
- Chapter 36: "Community Reaction of Noise"
- Chapter 39: "Anti-Noise Ordinances"
- Chapter 40: "Noise Control Requirements in Building Codes"

Laws of 90th Congress, Public Law 90-411, "An Act to Amend the Federal Aviation Act of 1958 to Require Aircraft Noise Abatement Regulation, and For Other Purposes," July 21, 1968 (Appears in U.S. Code Congressional and Administrative News, August 15, 1968 (Code 8), pp. 2155-2156)

For further information (literature or status of legislation) contact Elizabeth Cuadra, Noise Abatement Coordinator, California Membership, Acoustical Society of America, 12416 Deerbrook Lane, Los Angeles, California 90049 (213) 472-8201.

SIERRA CLUB, 220 BUSH STREET, SAN FRANCISCO, CALIFORNIA 94104
JANUARY 1971

CONSERVATION AND ENVIRONMENTAL ORGANIZATIONS

General Conservation

Conservation Foundation
1250 Connecticut Avenue, N.W.
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Friends of the Earth
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National Audubon Society
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New York, N.Y. 10028

National Parks Association
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Washington, D.C. 20009

Nature Conservancy
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Washington, D.C. 20005

Sierra Club
220 Bush Street
San Francisco, Calif. 94104

Wilderness Society
729 15th Street, N.W.
Washington, D.C. 20005

International Union for Conservation
of Nature and Natural Resources
1110 Morges, Switzerland

Conservation Education Association
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

Wildlife

Defenders of Wildlife
1346 Connecticut Avenue, N.W.
Washington, D.C. 20036

New York Zoological Society
630 Fifth Avenue
New York, N.Y. 10020

World Wildlife Fund
910 17th Street
Washington, D.C. 20006

National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036

Ducks Unlimited
Box 66300
Chicago, Ill. 60666

Izaak Walton League of America
719 13th Street, N.W.
Washington, D.C. 20005

Wildlife Management Institute
709 Wire Building
Washington, D.C. 20005

Trout Unlimited
5850 East Jewell Avenue
Denver, Colo. 80222

Environmental Problems

Committee for Environmental Information
438 N. Skinker Boulevard
St. Louis, Mo. 63130

Environmental Defense Fund
P.O. Drawer 740
Stony Brook, N.Y. 11790

Ecology Action
3029 Benvenue
Berkeley, Calif. 94709

Conservation Library Center
Denver Public Library
1357 Broadway
Denver, Colo. 80222

Water Pollution Control Federation
3900 Wisconsin Avenue, N.W.
Washington, D.C. 20016

Citizens for Clean Air
40 West 57th Street
New York, N.Y. 10019

Citizens League Against Sonic Boom
19 Appleton Street
Cambridge, Mass. 02138

Town-Village Aircraft Safety and
Noise Abatement Committee
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Lawrence, N.Y. 11559

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515 Madison Avenue
New York, N.Y. 10022

Zero Population Growth
367 State Street
Los Altos, Calif. 94022

Professional

American Association for the
Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

Ecological Society of America
c/o Biology Department
Duke University
Durham, N.C.

Professional (cont.)

American Institute of Architects
1735 New York Avenue, N.W.
Washington, D.C. 20006

American Society of Landscape
Architects
2013 Eye Street, N.W.
Washington, D.C. 20005

American Institute of Planners
917 15th Street, N.W.
Washington, D.C. 20005

League of Women Voters
1730 M Street, N.W.
Washington, D.C. 20036

California

California Roadside Council
2636 Ocean Avenue
San Francisco, Calif. 94132

Northern California Committee
for Environmental Information
1811 Francisco Street
Berkeley, Calif. 94703

California Tomorrow
681 Market Street
San Francisco, Calif. 94105

Committee of Two Million
760 Market Street, Rm. 1032
San Francisco, Calif. 94102

Desert Protective Council
Box 33
Banning, Calif. 92220

Get Oil Out! (GOO)
Box 1513
Santa Barbara, Calif. 93102

League to Save Lake Tahoe
1850 Fulton Street
Palo Alto, Calif. 94303

Council on Planning and
Conservation
522 No. Foothill Road
Beverly Hills, Calif. 90210

Planning and Conservation League
909 12th Street
Sacramento, Calif. 95814

Preservation of the Tule Elk
5512 Markland Drive
Los Angeles, Calif. 90022

Save the Redwoods League
114 Sansome Street
San Francisco, Calif. 94104

Friends of the Sea Otter
Big Sur, Calif. 93920

San Francisco Bay Region

Save San Francisco Bay Association
Box 925
Berkeley, Calif. 94701

Committee for Green Foothills
Box 11511
Palo Alto, Calif. 94306

Ecology Center
2179 Allston Way
Berkeley, Calif. 94701

Contra Costa Hills Club
306 40th Street
Oakland, Calif. 94609

Contra Costa Parks and Recreational
Council
176 Waterman Court
Danville, Calif. 94524

Regional Park Association
1001 Cragmont
Berkeley, Calif. 94708

People for Open Space
126 Post Street
San Francisco, Calif. 94104

Citizens Against Air Pollution, Inc.
110 Roundtable Drive, 14-1
San Jose, Calif. 95111

Marin Conservation League
914 Fifth Avenue
San Rafael, Calif. 94901

Tamalpais Conservation Club
244 Pacific Building
821 Market Street
San Francisco, Calif. 94103

This list has been compiled by the Sierra Club, 1050 Mills Tower, 220 Bush Street, San Francisco, Calif. 94104. We and the above organizations recognize that continued human survival demands that man limit his usage of the earth and its resources. Your support is needed.

ENVIRONMENTAL RESOURCE SHEET

1. PERIODICALS

Sierra Club Bulletin (monthly)
1050 Mills Tower
San Francisco, Calif. 94104

Natural History (monthly)
The American Museum of Natural History
New York, N.Y. 10024

National News Report (weekly)
Sierra Club
1050 Mills Tower
San Francisco, Calif. 94104

Environment (monthly)
Committee for Environmental Information
438 N. Skinker Blvd.
St. Louis, Mo. 63103

Audubon (bimonthly)
National Audubon Society
1130 Fifth Avenue
New York, N.Y. 10028

Cry California (quarterly)
California Tomorrow
681 Market Street
San Francisco, Calif. 94105

2. TEACHING AIDS

a) Resource Bibliographies

Conservation Education, A Selected Bibliography. Compiled by Joan Carvajal & Martha Munzer for the Conservation Education Association, 1968. Order from Interstate Printers & Publishers, Inc., Danville, Illinois, $2.50.

Conservation Library Center
Denver Public Library
1357 Broadway
Denver, Colorado 80203

A Select Bibliography
c/o Katharine Dexter McCormick Library
Planned Parenthood - World Population
515 Madison Avenue
New York, N.Y. 10052

b) Pamphlets & Reprints available from:

National Audubon Society
1130 Fifth Avenue
New York, N.Y. 10028

The Wilderness Society
729 - 15th Street NW
Washington, D.C. 20005

California Tomorrow
681 Market Street
San Francisco, Calif. 94105

National Wildlife Federation
1412 - 16th Street NW
Washington, D.C. 20036

Scientists' Institute for Public Information
30 East 68th Street
New York, N.Y. 10021

Environmental Workbooks
Air Pollution
Water Pollution
Hunger
Pesticides
Nuclear Explosives in Peacetime
Environmental Costs of Electric Power
Environmental Education 1970
Environmental Effects of Weapons Technology
$1.00 each, Set of 8, $5.00

---Sierra Club materials enclosed---

3. TEXTS

People and Their Environment: A Teacher's Curriculum Guide to Conservation Education, edited by Matthew J. Brennan. 1968. J.G. Ferguson Publishing Company, 6 North Michigan Avenue, Chicago, Illinois 60602.

Good bibliographies, outlines, concepts; $3.95 each:

Grades 1-2-3	Home Economics Biology
Grades 4-5-6	Outdoor Laboratory
Grades 7-8-9	Science, Social Studies
Grades 10-11-12	Science, Social Studies

A Place to Live, A Program in Urban Ecology; grades 4-5-6.
National Audubon Society — 75¢/copy
1130 Fifth Avenue — $1.50/teacher's manual
New York, N.Y. 10028

Earth Science Kit, An Inquiry Development Program; grades 8-12.
Science Research Associates
259 East Erie Street
Chicago, Illinois 60611

FOR TEACHERS, HIGH SCHOOL AND COLLEGE STUDENTS:

The Ballantine - Sierra Club and Friends of the Earth series.

SPECIAL TEACHER AIDS

Interpreting Our Heritage. Tilden, Freeman. Chapel Hill, University of North Carolina Press, 1957. $1.65, paperback.

Science in Your Own Backyard. Vintage Books. 75¢, paperback.

4. FILM CATALOGUES

A Critical Index of Conservation Films
The Conservation Foundation $1.00
30 East 40th Street
New York, N.Y. 10016

Conservation and the Natural Environment
Bureau of AV Instruction
University of Wisconsin
Box 2093
Madison, Wisconsin 53701

Films on the Environmental Crisis
ENACT, University of Wisconsin
12 Agricultural Hall
Madison, Wisconsin 53706

Sierra Club Films
Association Films, Inc.
25358 Cypress Avenue
Hayward, Calif. 90007

Films and Slides
National Audubon Society
1130 Fifth Avenue
New York, N.Y. 10028

Most National Park Service-administered areas have good environmental study areas available for classroom use. Contact your local NPS office for information on local programs.

AN ENVIRONMENTAL PROBLEMS BIBLIOGRAPHY

Environment	*America's Changing Environment.* R. Revelle & H. Landsberg. Boston: Houghton Mifflin. $6.95. *Resources and Man.* National Academy of Sciences. San Francisco: Freeman. $2.95. **Terracide.* R. Linton. Boston: Little, Brown. $7.95. *Science and Survival.* B. Commoner. New York: Viking. $1.35.
Ecology	**The Web of Life.* J. Storer. New York: New American Library. $ .60. *Environmental Conservation.* R. Dasmann. New York: Wiley. $4.95. *The Subversive Science: Essays Toward an Ecology of Man.* P. Shepard & D. McKinley. Boston: Houghton-Mifflin. $5.95.
Population	**The Population Bomb.* P. Ehrlich. New York: Ballantine. $ .95. *Population, Evolution, and Birth Control.* G. Hardin. San Francisco: Freeman. $2.95.
Pollution	*Air Pollution: A Primer.* New York: National Tuberculosis Association. *Air Conservation.* J. Dixon. Washington: American Association for the Advancement of Science. $8.00. *Community Action Program for Water Pollution Control.* Washington: National Association of Counties. $1.00. *S/S/T and Sonic Boom Handbook.* W. Shurcliff. New York: Ballantine. $ .95. *Perils of the Peaceful Atom.* R. Curtis & E. Hogan. New York: Ballantine. $1.25. **Silent Spring.* R. Carson. New York: Crest. $ .95. *Pesticides and the Living Landscape.* R. Rudd. Madison: University of Wisconsin. $1.95. **The Waste Makers.* V. Packard. New York: Pocket Books. $ .75.
California	*The Destruction of California.* R. Dasmann. New York: Collier. $1.50. *Federal Threats to the California Landscape.* S. Wood & D. Lembke. San Francisco: California Tomorrow. $1.00. *Open Space: The Choices Before California.* E. Williams. San Francisco: Diablo. $4.95. *Handbook of the San Francisco Bay Region.* R. Dreisbach. Palo Alto: Environmental Studies. $3.95.
Change	*Ecotactics: The Sierra Club Handbook for Environmental Activists.* J. Mitchell. New York: Pocket Books. $ .95. *The Environmental Handbook.* G. DeBell. New York: Ballantine. $ .95.
Other Ways	**Walden.* H. Thoreau. New York: New American Library. $ .50. *Sand County Almanac.* A. Leopold. New York: Oxford. $1.95. *The Immense Journey.* L. Eisley. New York: Random House. $1.45. *Whole Earth Catalog.* Menlo Park: Portola Institute. $4.00.

These are some of the best introductory books on environmental problems. The asterisk (*) indicates six titles that one might read first. More extensive bibliographies can be found in *Ecotactics, The Environmental Handbook,* and several of the other books listed above.

Sierra Club, 1050 Mills Tower, 220 Bush Street, San Francisco, CA 94104

The Sierra Club was founded in 1892 "... to explore, enjoy, and preserve the Sierra Nevada and other scenic resources of the United States and its forests, waters, wildlife, and wilderness; to undertake and to publish scientific, literary, and educational studies concerning them; to educate the people with regard to the national and state forests, parks, monuments, and other natural resources of especial scenic beauty and to enlist public interest and cooperation in protecting them."

In 1969 the Club added "environmental survival" to its list of conservation priorities for the coming decade.

The Sierra Club:

... urges that the problem of preserving a livable environment – the most basic problem of human survival – be treated by the United States as no less important than the problem of national security or the challenges of the space age.

... believes that the fundamental charters of our government should commit themselves to achieving a clean and healthy environment for the American people. To that end, the club urges both the federal government and the governments of the individual states to enact constitutional amendments that guarantee the same degree of protection to individual rights to a clean and healthy environment as are now enjoyed by the freedoms outlined in the Bill of Rights of the American Constitution.

... urges that the United States and each of its individual states and lesser political entities abandon all policies, projects or programs, including tax exemptions, designed to foster, subsidize or promote population growth.

... urges that the United States and each of its individual states and lesser political entities actively promote educational programs aimed at stabilizing the population within the earliest possible time.

... urges that each of the individual states of the United States legalize abortion.

... approves in principle legislation that will ban the sale of new automobiles powered by the internal combustion engine in California after January 1, 1975.

... urges the federal government to establish an immediate ban on the manufacture or use of all persistent chlorinated hydrocarbons (DDT, etc.)

SIERRA CLUB FILMS

Sierra Club films are superb sources of sound conservation information and the Club would very much appreciate having them brought to the attention of responsible educators and librarians concerned with conservation education, for possible addition to their collections through purchase or special gift.

The following is an up-to-date list, with description, of currently available Sierra Club films:

Grand Canyon	An exploration of the Grand Canyon, its secret places, its living geology, its wonder, from the vantage point of the river itself. By Martin Litton, Jeffrey Ingram, David Brower. 26 min.,sound and full color, $315.00
An Island in Time	Point Reyes National Seashore is explored to reveal the beauty, the varied ecology and the unique geology of this valuable recreational resource. By Laurel Reynolds and Mindy Willis. 28 min.,sound and full color, $315.00
Wilderness Alps of Stehekin	A part of Washington's North Cascades , a mountain fastness of extraordinary richness and beauty, lying between "shining seas". By David Brower. 30 min.,sound and full color, $315.00
Wasted Woods	A biting commentary on the destructive logging carried on in the Northwestern part of the United States. By Harvey Richards. 15 min.,sound and color, $200.00
Glen Canyon	That uniquely beautiful stretch of the Colorado River, before and after the construction of the dam; a poignant film experience. By Phil Pennington. 29 min.,sound and full color, $315.00
Two Yosemites	A needed scenic-recreations resource was lost with the damming of Yosemite's twin valley, Hetch Hetchy. The tragedy of the lost Yosemite. By David Brower. 10 min.,sound and full color, $125.00
Nature Next Door	Exploration of Berkeley's Tilden Regional Park, near San Francisco, demonstrating the importance of ready access to natural land and wild creatures for children. By Robert C. Stebbins (superb companion booklet also available at $.75) 28 min.,sound and full color, $315.00

No Room for Wilderness?	A remarkable population/ecology film, primarily based on African Materials. Excellent for school use--adults too! By Robert C. Stebbins 26 min.,sound and full color, $315.00
The Redwoods	An Academy Award winner, this tragi-poetic study helped to create the Redwood National Park. 20 min.,sound and full color, $250.00
Wilderness River Trail	A romantic study of the Dinosaur National Monument via the Yampa and Green Rivers, tributary to the Colorado. By Charles Eggert, Martin Litton, Nathan Clark. 28 min.,sound and full color, $315.00
Redwoods--Saved?	A brief but powerful statement of the continuing threat to the coast redwoods. 3-1/2 min.,sound and full color, $47.50

Requests to purchase prints should be addressed only to:

ASSOCIATION FILMS, INC.,
25358 Cypress Avenue
Hayward, Calif. 94544

Telephone: (415)783-0100

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SIERRA CLUB FILM RENTAL POLICY

We do not want to deny our films to any group or organization that may be unable to afford a film rental charge. For this reason there is no charge for film rental or for preview films.

However, the fight to preserve wilderness is a costly fight. For this reason, we have a suggested nominal handling charge of $5.00. This suggested handling charge barely covers servicing and shipping of films. We would welcome contributions in any amount to enable us to produce new films to further our fight for conservation.

These films are all available from any of the offices of ASSOCIATION FILMS, INC., listed below:

California
25358 Cypress Avenue
Hayward, Calif. 94544

2221 So. Olive St.
Los Angeles, Calif. 90007

Georgia
2227 Faulkner Road, N.E.
Atlanta, Ga. 30324

Illinois
521 Burlington Ave.
La Grange, Ill. 60525

Massachusetts
484 King Street
Littleton, Mass. 01460

New Jersey
600 Grand Avenue
Ridgefield, N.J. 07657

Pennsylvania
324 Delaware Avenue
Allegheny County
Oakmont, Penna 15139

Texas
8615 Directors Row
Dallas, Texas 75247

Because the Club is unable to make as many prints available as it would like, prints may not always be available from these offices, at times that Sierra Clubbers might like. For particular titles which a Chapter or another unit of the Club might wany to use more frequently, it is strongly urged that a print be purchased for local use. The prices of prints quoted above include reel, reel can and shipping case.

SIERRA CLUB/BALLANTINE PAPERBACK EDITIONS

ALL ORDERS FOR THESE TITLES MUST BE PLACED WITH BALLANTINE BOOKS, INC

ALMOST ANCESTORS	$3.95
BAJA CALIFORNIA	3.95
CENTRAL PARK COUNTRY: A Tune Within Us	3.95
EVEREST: The West Ridge	3.95
THE FRAIL OCEAN	.95
GALAPAGOS: Vol. I & II (boxed sets, $8.50)	3.95 (ea.)
GENTLE WILDERNESS: The Sierra Nevada	3.95
GRAND CANYON OF THE LIVING COLORADO	3.95
IN WILDNESS IS THE PRESERVATION OF THE WORLD	3.95
KAUAI and the Park Country of Hawaii	3.95
LAST REDWOODS	3.95
MANUAL OF SKI MOUNTAINEERING	.95
MOMENT IN THE SUN	95
NAVAJO WILDLANDS	3.95
NOT MAN APART (The Big Sur Coast)	3.95
ON THE LOOSE	3.95
THE PLACE NO ONE KNEW	3.95
POPULATION BOMB	.95
SIERRA CLUB WILDERNESS HANDBOOK	.95
SUMMER ISLAND: Penobscot Country	3.95
THIS IS THE AMERICAN EARTH	3.95
TIME AND THE RIVER FLOWING: Grand Canyon	3.95
VOICES FOR THE WILDERNESS	.95
WILD CASCADES	3.95

****

SEND YOUR ORDER WITH CASH OR CHECK TO:

BALLANTINE BOOKS, INC.
101 Fifth Avenue
New York, New York 10019

Membership Discount: 10% off (cash orders only)

WHAT YOU CAN DO about environmental problems

1. **Inform yourself. Four books offer especially good introductory reading about environmental problems:**

   ***Ecotactics*. J. Mitchell. New York: Pocket Books. $ .95**
   ***The Population Bomb*. P. Ehrlich. New York: Ballantine. $ .95**
   ***Terracide*. R. Linton. Boston: Little, Brown. $7.95**
   ***The Environmental Handbook*. G. DeBell. New York: Ballantine. $ .95**

   These titles should be available at local bookstores. More extensive bibliographies and other educational materials on environmental problems are also available from several of the groups listed below.

2. **Keep informed of current problems. Several magazines and newsletters maintain excellent coverage of environmental news:**

   ***National News Report* (weekly)**
   Sierra Club
   1050 Mills Tower
   San Francisco, Calif. 94104
   ($12.00 / yr.)

   ***Conservation Report* (weekly)**
   National Wildlife Federation
   1412 16th Street, N.W.
   Washington, D.C. 20036

   ***Environmental Action Bulletin* (weekly)**
   Rodale Press, Inc.
   Emmaus, Pa. 18049
   ($10.00 / yr.)

   ***Environmental Reporter* (weekly)**
   Bureau of National Affairs, Inc.
   Washington, D.C. 20037
   ($280.00 / yr.)

   ***CF Letter* (weekly)**
   The Conservation Foundation
   1250 Connecticut Avenue, N.W.
   Washington, D.C. 20036
   ($6.00 / yr.)

   ***Environment* (monthly)**
   Committee for Environmental Information
   438 N. Skinker Boulevard
   St. Louis, Mo. 63103
   ($8.50 / yr.)

3. **Join groups. For immediate action on specific issues, you'll work most effectively with community groups or the local chapters of national organizations.**

   Join the Sierra Club. The strength of the Sierra Club is in its volunteer leadership and individual members' commitment to local action programs for environmental protection. Thirty chapters are active throughout the country. New members normally join the national organization and are then contacted by the local chapters. If you wish to contact a chapter directly, however, please write for the address of the one nearest you.

   Many other organizations are working on environmental problems. Several of these groups are especially active:

   Zero Population Growth
   367 State Street
   Los Altos, Calif. 94022

   National Audubon Society
   1130 Fifth Avenue
   New York, N.Y. 10028

   The Wilderness Society
   729 15th Street, N.W.
   Washington, D.C. 20005

   Friends of the Earth
   30 East 42nd Street
   New York, N.Y. 10017

These national organizations have local chapters or affiliations with similar groups across the country.

4. Work for change through direct community action: picket, distribute leaflets, boycott environmentally destructive products. A sincere commitment to environmental survival requires changes in one's way of life. It entails giving up the use of high octane leaded gasoline, eight-cylinder high-pollution automobiles, non-returnable beverage containers, detergents that contain phosphates. Action of this nature is described in *Ecotatics* and is regularly discussed in *Environmental Action Bulletin*. Ecology Action groups have gathered practical information about what individuals can do to lessen their impact upon the environment.

5. Work to change and create laws through activity in civic affairs and community programs. Much can be accomplished by signing, circulating, and initiating petitions; by attending and speaking at public meetings and hearings; by writing elected officials. Letters to your United States Senator, Representative, and the President should be addressed to:

   Senate Office Building, Washington, D.C. 20510
   House Office Building, Washington, D.C. 20515
   The White House, Washington, D.C. 20006

   Work with groups and in political campaigns. Very good information about how to do this effectively is available from the League of Women Voters, 1730 M Street, N.W., Washington, D.C. 20036. The National Association of Counties, 1001 Connecticut Avenue, N.W., Washington, D.C. 20036, has also published useful materials for community leaders and officials. Their pamphlet sets outlining community action programs on air and water pollution are excellent.

6. Time is running out. Only now are we beginning to see how greatly we have damaged our physical environment. This can be changed. We hope that you will help.

Admission fee and dues:

Admission fee, $5. per person; or per family, when members of an immediate family apply at the same time. Admission fee waived for full-time students; please supply name and location of school.

	Dues	Admission	Total
Regular	$12.00	$5.00	$17.00
Spouse	6.00	5.00	11.00
Junior (12 to 21)	5.00	5.00	10.00
Supporting	25.00	5.00	30.00
Contributing	50.00	5.00	55.00

Dues are for one year's membership and renewal notices will be sent annually. Dues include subscription to Sierra Club Bulletin.

Sierra Club, 1050 Mills Tower, San Francisco 94104 Date..................

I have informed myself about the purposes of the Sierra Club and wish to support them. I hereby apply for membership and enclose $__________ as admission fee and dues, which will be refunded if I am not elected.

Print Name Mr. Mrs. Miss ....

Print Mailing Address ....

.... Zip Code ....

Tel. No. .... If under 21, give date of birth ....

Signature of Applicant ....

I sponsor the applicant and believe him interested in advancing the club's purposes. (Sponsor must be over 21 and a member for a year. If you know no members, write the Club's President.)

Print name and city ....

Signature of sponsor .... Date..................

APPENDIX D. STUDENT PAPERS ON SPEAKERS, FIELD TRIPS, MOVIES

The following papers are copies of notes and papers handed in during the course of the project. After each paper was graded, it was handed back to the student to be placed in his reference notebook.

Moore — Lakes -- Aging and Pollution

Lakes are standing bodies of water that will someday disappear. They are formed when the flow of water in a stream or river is blocked

Lakes differ in many ways, physically and biologically.

Much life in a small lake or pond community is so small it can only been seen through a microscope.

A lake is composed of several habitats.

The habitat an animal lives in a lake is determined mainly by oxygen and food. Light and minerals determine where plants grow in a lake.

All animals need oxygen. Some get oxygen from the air, while other animals get their oxygen from the water.

Lakes soon become "old".
Material drops in to cover the bottom. The water has a cloudy, green color because of the abundance of algae in it. There are many old lakes and at the bottom, there are dead, rotting materials. There is little oxygen in the water so very few organisms can live here.

It usually takes hundreds of thousands of years for a lake to grow old and die, but this aging process can be speeded up when fertilizers such as human sewage and animal wastes are added. This is a form of Pollution.

Man uses clear, unpolluted fresh water for many purposes. The needs for unpolluted water is incresing and the amount of water used per person is getting larger. The amount of clear fresh water is limited. Pollution increases and then decreses it's amount.

Stephanie

4 period Science Science

April 18, 1971

"Northwest air Pollution Control authority" and Mrs. Nelson's talk

air pollution can be a nuissance and the pollutants in it can damage crops. it's an established fact. it is also harmful to your health.

Visual emissions are smoke going into the air. there are regulations against them. Particulate matter are tiny particles that you can see, like dust, fumes, and smoke, etc. Sulphur dioxide is a gas that is put into the air from fuels when they are burned. the exhaust from automobiles in the Skagit County put out 42.5 percent of the pollution that goes into the air. In July 1970, the burning of old automobile bodies became illegal. the car bodies that cannot be burned are taken to Seattle where a machine gets rid of them. Industries in the Skagit County put out 42.5 percent of the pollution. Fuel combustion, the burning of natural gases and fuels in homes put out 3.2 percent pollution. Outdoor burning, such as bar-b-q's and garbage and leaves burning put out 4.8 percent pollution. Miscellaneous sources put out 7 percent of the pollution. these would be things like gasoline, burning of rubber tires, (which people are not allowed to burn, along with heavy oils), cigarette smoke, areosal cans, perfumes, mothballs, and paints, etc.

Island counties put out 76 percent of the pollution from mobile sources. Industries put out 1.7 percent of pollution. Fuel combustion puts out 4.7 percent of pollution. Outdoor burning puts out 5.8 percent of the pollution. Miscellaneous sources puts out 11 percent of pollution.

The five major polluters, which are all in anacortes which compounds the problem and makes all the more pollution are Scott Paper, Shell oil, Texaco, Allied, and Publishers Paper. Scott Paper puts out 6 million pounds of pollution per year. Shell Oil puts out 60 million pounds of pollution per year. Texaco puts out 33 million pounds of pollution per year. Allied puts out 3.6 million pounds of pollution per year. and Publishers Paper puts out 2.7 million pounds of pollution per year.

The different kinds of classified air pollution are hydrocarbons, organics, particulate matter, oxides of sulphur, oxides of nitrogen, and carbon monoxide. 9 million pounds of hydrocarbons are put out, .5 million pounds of organic substances, .29 million pounds of particulate matter are put out, 8.5 million pounds of oxide of nitrogen, 38.5 million pounds of oxide of sulphur, and .1 million pounds of carbon monoxide are put out. The Los Angeles smog is made of the hydrocarbons, organic, and oxide of nitrogen. The particulate matter and oxide of sulphur are the most dangerous and harmful to your health. Hydrocarbons, organics, particulate matter, oxides of nitrogen, and carbon monoxide are from mobile sources.

Refineries near Anacortes have tried to cut down on their polluting of the air. Conifer trees are dyeing or are already dead near Northwest Petro Chemical Plant. The plant Allied ~~Com~~ Chemicals is polluting the air and killing trees also. Teepee burners pollute also. Georgia Pacific, the recycling plant,

~~pto~~ pollutes the air. Smokestacks add a small amount of pollution, but it adds up and it is a nuissance.

The Northwest also gets air pollution from other areas. Everette is one place. another place is British Columbia where the paper mills pollute.

The Northwest air Pollution Control authority in Mt. Vernon has many machines that tell what and how much is polluting the air. There is a laboratory there where the scientists carry on experiments and tests.

individuals can help in many ways. they can quit driving around in cars and start walking or riding ~~by~~ bicycles. If they do ride a car they should keep it tuned up and in good condition. use less paper. Don't burn outdoor fires unless ~~nes~~ necessary.

Notes on Georgia Pacific

The process that paper goes through to get recycled is the following:

① **Waste Paper Storage**

Close to one acre of paper. The paper is stored here until it is ready to be recycled.

② **Pulper**

Paper is mixed with water and chemicals, into a liquid form.

③ **Refiner**

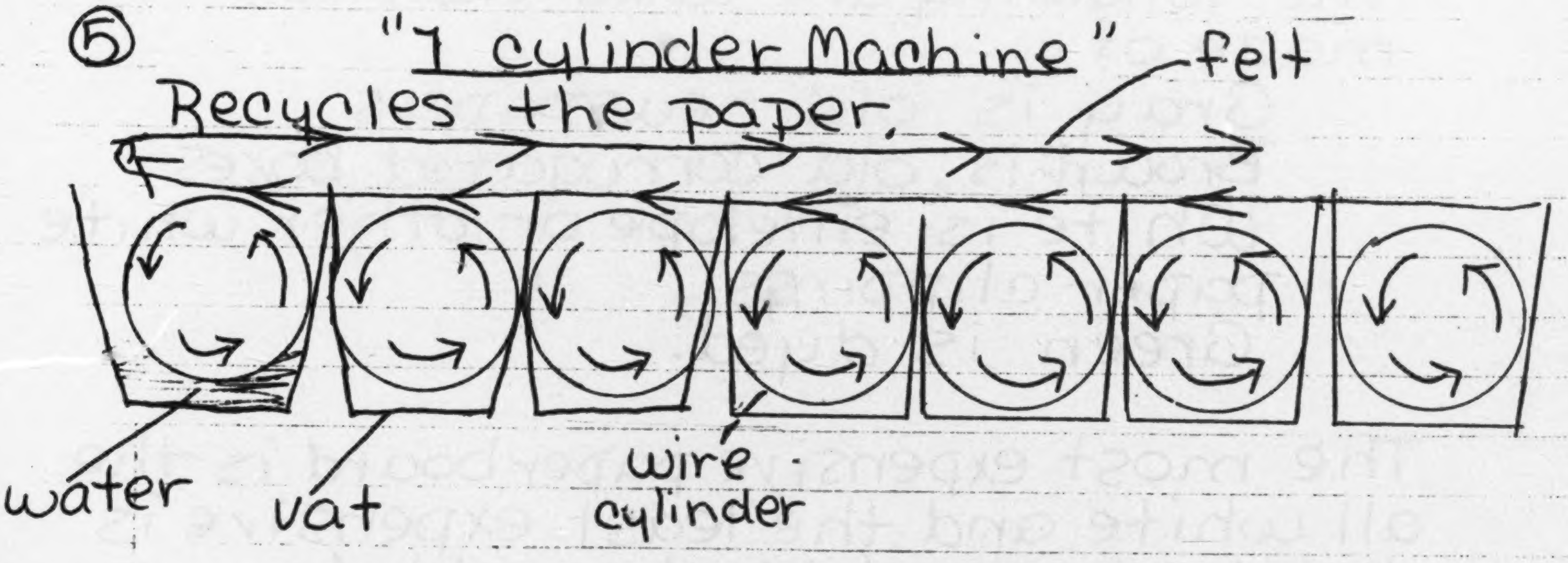
Grinds up the old used papers.

④ **Screens**

Takes out garbage in paper and water is screened out.

⑤ **"7 cylinder Machine"**

Recycles the paper.



The wire cylinders turn around and water goes out, but pulp sticks to it. Then the felt comes around, making the pulp (old paper) stick to it. Makes a thin layer of paper.

⑥ Press

Removes water from paper.

⑦ Dryer

Dries the paper with steam heat.

⑧ Calendar Stacks

Prepares the surface of paper for printing.

⑨ Paper Cutter

Cuts the paper into sheets
or
Rolls the paper

Any color of paper can be made. The following are what each color is made of:

Gray is old newspapers
Brown is old corrugated boxes
White is envelope or other white paper clippings.
Green is dyed.

The most expensive paperboard is the all white and the least expensive is the brown and black speckled.

The following are relative costs compared to bleached pulp (100%) -

Envelope clippings - 90%
Paper trimmings - 85%
Tab cards - 65%
Magazine paper - 45%
Newspaper - 35%
Computer print-out cards - 20%

The quality of the paper decreases as the relative cost goes down.

Georgia Pacific turns out 50 tons of paperboard per day and uses 40 tons of used paper. The other 10 tons is pulp.

APPENDIX E. EXCERPTS FROM GROUP PLAN RESEARCH

This section serves to give a very brief idea of the types of information the groups may uncover while researching their subject areas.

Question- 6

What are the sources of air pollution in Skagit County?

The sources of air pollution in Skagit County oar not one but many matter of fact there are ~~ten~~ 10 magor pollters and five of them are in Skagit County. (seen on table)
Some of the polluter in Skagit County are the Alila Chimicals, some 30 wigwam burners, rubber tiers and oil. But still alot of pollution is carried over by the wind from Bellingham, Everet, and Britsh Columbia.

They have recorded that cars put 6% of pollution into air.

table Defined in 2 ways

Skagit County 42% man made moble scares such as- automoblies, plans trucks

Industry 42.5% clasafid by itself

full combastion 3.2% (oil to heat the

Outdoor burning 4.2%

Misellailous sures 7% (Dry Clearers cigeret smoking, moth balls, rubber tires)

Hear is a table of the 5 ~~mager~~ magor polluters in Skagit County

		million pound per year
(1)	Scott paper	6. million pound per y
(2)	Shell oil	60. per year
(3)	Texaco	33. per year
(4)	Allied	3.6 per year
(5)	Pubishers paper	2.7 per year

Pesticide
questions

Peggy Beitler
Kim Jordan
Paul Vlahovich

1. A pesticide is any type of chemical used to destroy "pests" on trees and other green plants. Their are many pesticides currently in the United States. There are herbicides, fungicides, biocides, rodenticides, predicides and others. Currently there are over 108 pesticides being used. These pesticides affect over 30 species of animals. Now is give an explaniation of the different types of pesticides.

Herbicides are used to destroy pesty herbs and weeds. These herbicides kill dandy-lions, sand rush, and other related weeds.

Fungicides are used to destroy funge on trees. The names of some fungicides are mercury, arsenic, captan and folpet.

Biocides are used to kill most any organism that is a pest. Biocides are the most widely used chemical in the pesticide family.

Rodenticides are used to kill rats, mice, moles and other rodents which damage grain crops.

Predicides are used to kill unwanted preditors that destroy crops.

2. There is much concern about DDT, PCB, mercury and arsenic. DDT and PCB are almost the same so they do almost the same type of destruction. They damage the reproductive system of animals. DDT and PCB have mainly disturbed the reproductive system of birds. The birds lay their eggs. When they go to hatch them they break. Then they (the young) die before they are hatched.

what are PCBs and where are they found

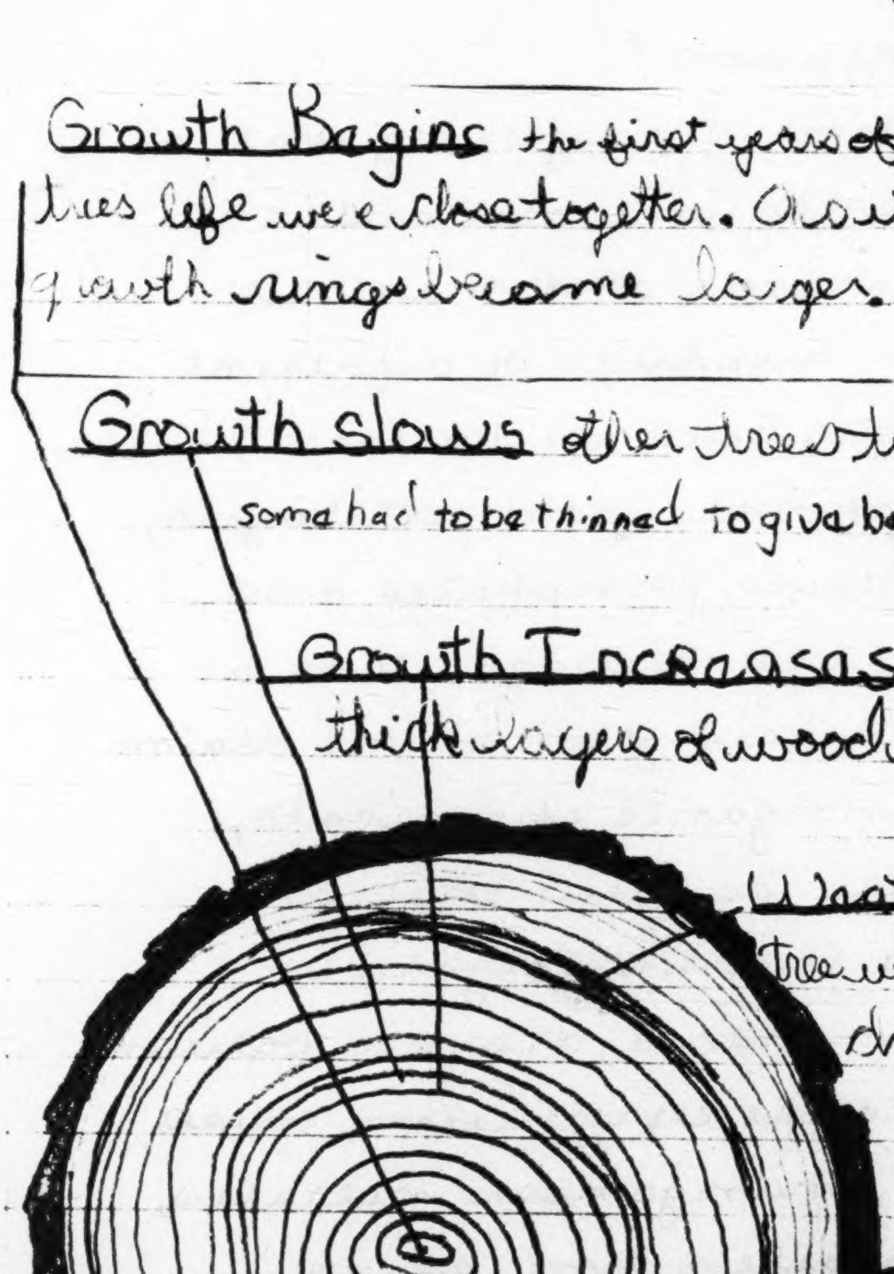
Mercury kills the fish in streams. It collects in the microrganisms. Tiny minnows eat the microrganisms while trout eat the minnows. The salmon eat the trout. Finally man eats the salmon. Each time a larger organism such as a trout eats a smaller organism such as a minnow the pesticide gets more consentrated. If it reaches a certain point it will kill. Many ecologists feel that "man" is an endangered species but no one knows if it is true.

TREES GROWTH

Growth Bagins the first years of this trees life were close together. As it grew growth rings became larger.

Growth slows other trees took living space some had to be thinned To give better chance to grow.

Growth Increases tree grew fast after thinning thick layers of wood each year.



Weather affects growth tree went through two years of dri weather

Ripe for harvest Tree reached end of growth and is ready for harvest.

Water Pollution

1. What is water pollution?

Water pollution is anything that is not found ordinarily in water and it changes its waters appearance and makes it unusable. there are hundreds of different kinds of pollutants, Such as: bacteria, viruses, oil, phosphorous from fertilizers, pesticides, weed killers, phosphates and detergents, municipal sewage, trace amounts of metals, acid from mine drainage, organic and inorganic chemicals. Many of them are so new that we don't know about them. Unorganic chemicals are ammonia, arsenic, barium, boron, cadium, chloride, chromium, copper, flouride, iron, lead, manganese, nitrates, nitrites, phosphorus, selenium, silver, sulfate, and zinc. Organic chemicals are cyanide, phenols, and pesticides. The different kinds of pesticides you can find are DDT, dieldrin, endrin, heptachlor, heptachlor epoxide, and toxaphene. There are radioactive substances such as radium 226 and strontium 90.

Eutrophication is the natural way of

a lake dying from pollution. It's from soil erosion, deposition of leaves, animal wastes, dead animals, and solution of minerals and other natural causes.

Man speeds up the aging and dying of lakes, rivers, streams,& waterways tremendously.

explain more completely (algae, O_2, etc)

2. What effect does water pollution have on lakes, rivers, and streams?

It causes them to age and die faster. They get so polluted we can't use the water anymore, go swimming, water skiing, scuba diving, or fishing. We have to shut down the area. All the fish and other animals that lived in the water would die.

3. What effect does water pollution have on human health, both mental and physical?

It causes illness. If you go swimming and you accidentally swallow some water you can get a germ and get a disease. Nitrate water is found in wells if it is drilled wrong and hits it. It can't do any harm to grown-ups, but it can cause mental illness and sickness to babies less than one years old. Some people swim for exercise, But if the waters are bad they can't.

It effects us mentally when someone goes swimming in a lake and says it's polluted and a bunch of other bad things about it, and so you don't go swimming there. And it was all in the mind because the lake wasn't really polluted, you jist thought it was. It also makes us feel bad when we find out our favorite lake that we liked to swim in is polluted. It makes up in a bad mood and accidents can happen. It puts strain on the person who is in the business selling clams and no one will buy them because they are bad from polluted water. It puts him out of business and he has to move his business to some other area.

Good

4. What is the effect of water pollution on plants and trees?

Bad water can kill the trees when they take it up through their roots. When the trees die there will be less oxygen.

no oxygen, we die.

If the plants and grass are bad from the bad water, when the animals eat it, like cows, they will get sick and die. Some will go to butchers. We buy the meat and eat it and get sick.

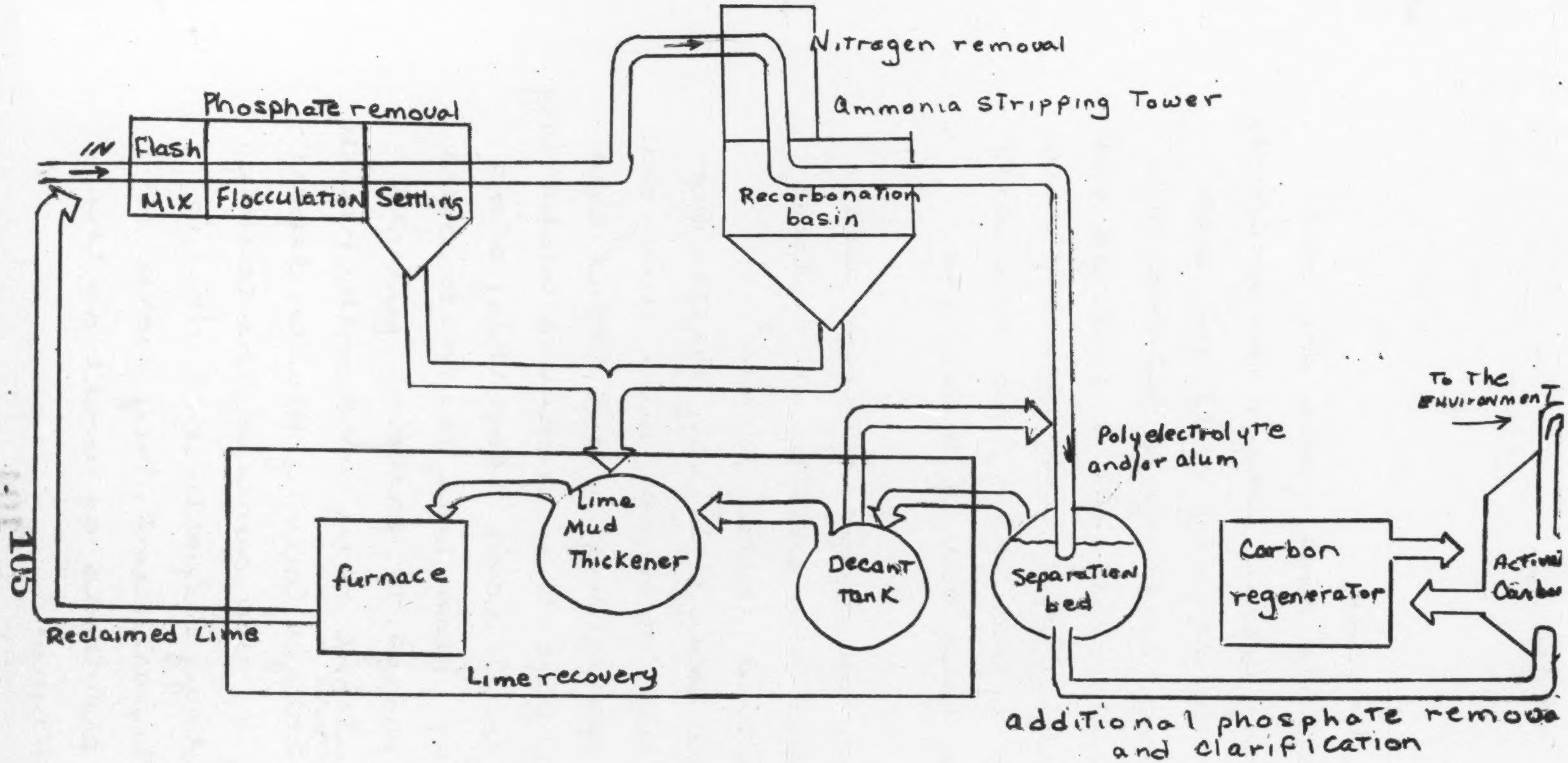
It kills the crops, like strawberries, if the crop is bad, then no one will buy and he goes out of business.

5. What agencies are responsible for water pollution control and quality at the local, county, state and federal levels?

Local - The Skagit County Health Department checks to make sure there are no ~~people~~, polluting in the local area. If so, they give the people a warning to stop. If they don't stop, they stop it. They can also take them to court. They find ways to prevent future water pollutions. They work on the health of the people.

County - Skagit County Health Department. They do the same for the county.

State - Ecology Department. This is a larger department. They work on the bigger problems as well as the little problems.


Phosphate removal
IN
Flash
MIX
Flocculation
Settling
Nitrogen removal
Ammonia Stripping Tower
Recarbonation basin
Polyelectrolyte and/or alum
To The Environment
Lime Mud Thickener
furnace
Decant Tank
Separation bed
Carbon regenerator
Activa
Carbo
Reclaimed Lime
Lime recovery
additional phosphate remova
and clarification

Advanced Sewage
TreatmenT

B´

Solid Waste Disposal & Recycling

(1.) Solid waste is usually defined in the negative sense that is, anything that does not go up the stack or down the drain can be considered as solid waste. The most familiar example of solid waste is the contents of the garbage cans, but other examples include junk automobiles, animal feed lot wastes, old tires, slag heaps and other discarded remains of our affluent society.

The kinds of solid wastes are: *Land Pollution* which is any defilement of the land enviroment, particularly when such defilement is unwarranted or ill-advised. *Municipal Refuse* is the part of solid waste that we are most familiar with which is the contents of our garbage cans. This is the material that is picked up by private contractors and hauled to landfills, open dumps, and incenerator facilities all over the country. It is this kind of solid waste that is most concerned with today, since this is where most food wastes end up and it is perhaps one of the most critical of our solid waste problems. Garbage is considered as municipal refuse too. It makes up about 14 percent of the municipal refuse.

2. In the past most of the garbage was put in open dumps which were a good breeding grounds for the rats and many types of diseases that weren't very healthy to people around the place. Or this garbage could have been just thrown around very carelessly by people who don't care very much about the sight seeing of our world.

3. There are many new ways of disposing of solid waste such as the use of compressed block of solid waste as land fill. They also use loose solid waste material as land fill for parks and low spots. They also have other ways such as open dumps and incineration. Open dumps and incinerators have there draw backs. Incinerators expell burned particules into the air that covers cars and other things. Open dumps stink up the air and when they burn stuff in them it also pollutes the air.

And the recycling of waste products such as aluminium cans, bottles,

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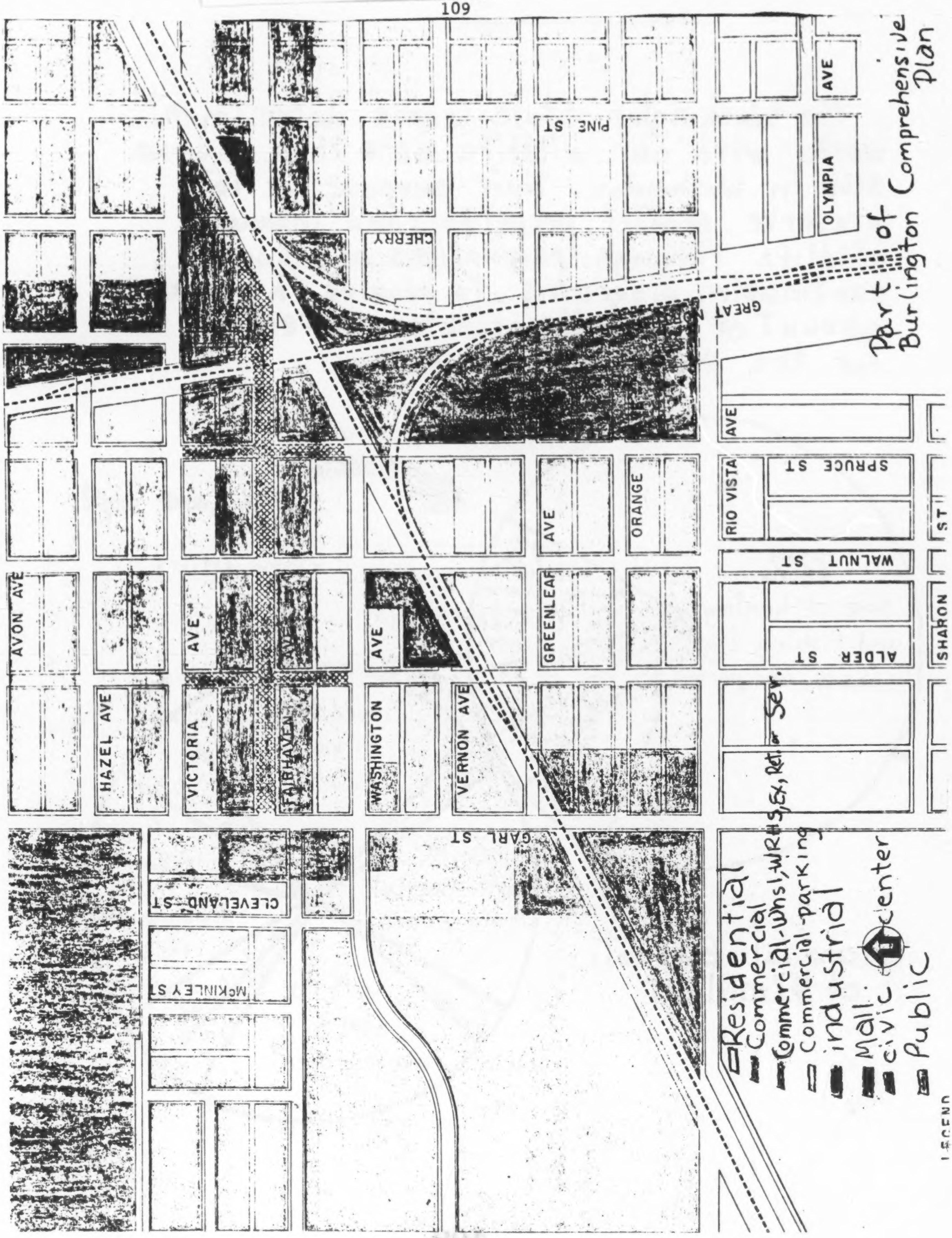
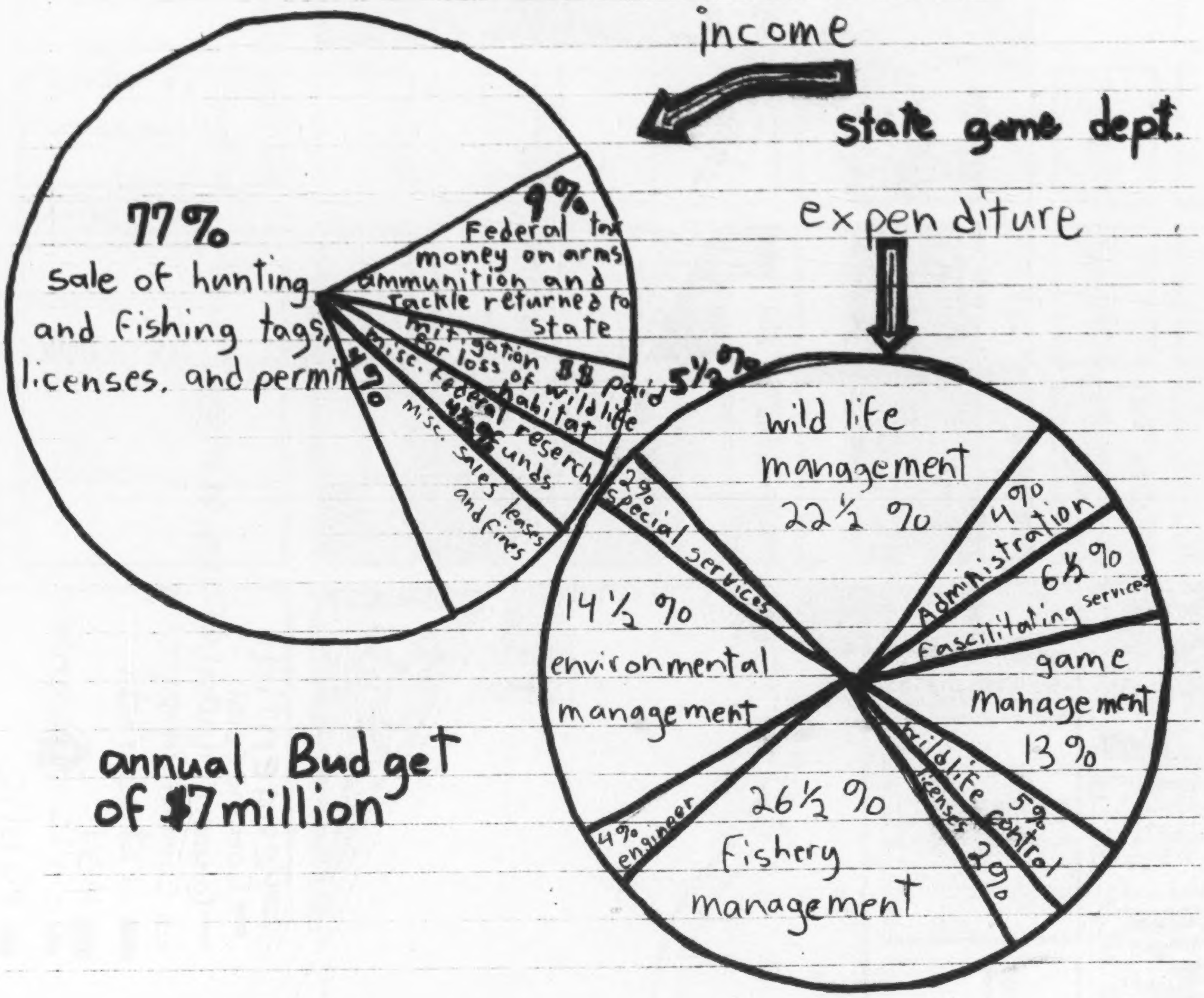


Part of Burlington Comprehensive Plan

AVON AVE
HAZEL AVE
VICTORIA AVE
FAIRHAVEN AVE
WASHINGTON AVE
VERNON AVE
GREENLEAF AVE
ORANGE
RIO VISTA AVE
SHARON
OLYMPIA AVE
PINE ST
CHERRY
GREAT NOR
SPRUCE ST
WALNUT ST
ALDER ST
CARL ST
CLEVELAND ST
McKINLEY ST
LEGEND
Residential
Commercial
Commercial-Whsl, WRHS, Ex, Ret. or Ser.
Commercial-parking
industrial
Mall
civic center
Public

The Washington State Game department works with our wildlife more than anyone else in Washington. Their purpose is to preserve, protect, perpetuate and inhance wildlife through regulations and sound continueing programs, To provide the maximum amount of wildlife oriented recreation for the people of the state.


income
state game dept.
expenditure
77% sale of hunting and fishing tags, licenses, and permits
9% Federal tax money on arms ammunition and tackle returned to state
mitigation $$ paid for loss of wildlife habitat 5½%
misc. Federal reserch funds
4% misc. sales leases and fines
annual Budget of $7million
wild life management 22½%
4% Administration
6½% Fascilitating services
game Management 13%
5% wildlife control
licenses 2%
26½% Fishery management
4% engineer
14½% environmental management
2% Special services